

ASM 182 TD+ / ASM 192 TD+ ASM 192 T2D+

HELIUM LEAK DETECTOR



User's Manual



adixen
by Alcatel Vacuum Technology



Alcatel Vacuum Technology, as part of the Alcatel Group, has been supplying vacuum pumps, leak detection systems, vacuum measurement and micro machining systems for several years. Thanks to its complete range of products, the company has become an essential player in multiple applications : instrumentation, Research & Development, industry and semiconductors. Alcatel Vacuum Technology has launched Adixen, its new brand name, in recognition of the company's international standing in vacuum position. With both ISO 9001 and 14001 certifications, the French company is an acknowledged expert in service and support, and Adixen products have the highest quality and environmental standards.



With 40 years of experience, AVT today has a worldwide presence, through its international network that includes a whole host of experienced subsidiaries, distributors and agents. The first step was the founding of Alcatel Vacuum Products (Hingham- MA) in the United States, thirty years ago, reinforced today by 2 others US subsidiaries in Fremont (CA) and Tempe (AZ). In Europe, AVTF-France headquarters and three of its subsidiaries, Alcatel Hochvakuumtechnik (Germany), Alcatel Vacuum Technology UK (Scotland) and Alcatel Vacuum Systems (Italy) form the foundation for the European partner network. In Asia, our presence started in 1993 with Alcatel Vacuum Technology (Japan), and has been strengthened with Alcatel Vacuum Technology Korea (in 1995), Alcatel Vacuum Technology Taiwan (in 2001), Alcatel Vacuum Technology Singapore, and more recently with Alcatel Vacuum Technology Shanghai (China) (in 2004). This organization is rounded off by more than 40 representatives based in a variety of continents.

Thus, whatever the circumstances, the users of Adixen products can always rely on quick support of our specialists in Vacuum Technology.



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A very wide range of helium leak detectors

Dear customer,

You have just bought an Alcatel leak detector. We would like to thank you and we are proud to count you among our customers. This product is a result of the experience acquired over 35 years by Alcatel in vacuum and leak detection technology.

The applications of helium leak testing are extremely diversified ranging from high-tech installation maintenance to high-speed testing of industrial products.

Each product of the ALCATEL detector range is designed to meet the specific needs of each application:

- portability,
- high sensitivity,
- pumping capacity,
- pumping type,
- automation and integration in an industrial process.



A very wide range of helium leak detectors

This product complies with the requirements of European Directives, listed in the Declaration of Conformity contained in G100 of this manual. These Directives are amended by Directive 93/68/E.E.C (E.C. Marking).

The Declaration of Conformity and Safety Instructions are available in German, Spanish, Italian, Portuguese, Dutch and Danish languages at the end of this manual.

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General contents

ASM 182 TD+ - ASM 192 TD+ - ASM 192 T2D+ User's Manual

Preliminary remarks Throughout this User's Manual, you could find this type of message "Summary of screen  C 140": it refers to a specific chapter of the User's Manual. Please read it for further information.

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L115 v3.0 r.01 (ASM 182 TD+)
L116 v3.0 r.01 (ASM 192 T2D+)
L132 v3.0 r.01 (ASM 192 TD+)

General contents

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Introduction

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Preliminary remarks Throughout this User's Manual, you could find this type of message "Summary of screen  C 140": it refers to a specific chapter of the User's Manual. Please read it for further information.

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Introduction to the ASM 182 / 192 series

A 200

ASM 182 TD+ / 192 TD+ - Detector operating principle

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- Pumping capacities
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Introduction

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Operator interface : control panel

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- Long Distance Sniffer probe
- 10 m/30 feet LDS extension
- Headphone connector
- Transport cart
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- Calibrated Helium leaks
- Calibration accessory
- Spray probe
- Inlet adaptor
- Printer
- Inlet filters
- Short distance sniffer probe (to be connected to the inlet part of a leak detector)
- Bombing chamber
- Test chambers (required interface board)
- Neutral gas vent line kit
- 4 swiveling wheels kit (Ø125 mm)
- Covered sniffer probe and remote control kit
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ASM 192 series - Dimensions

Introduction to the ASM 182/192 series

The ASM 182/192 series are the latest evolutions of ALCATEL leak detectors of which thousands are in successful daily operation throughout the world in various applications like automotive industry, chemical and mechanical, electrical, electronics or packaging industries, quality controls and maintenance of semiconductor process systems, vacuum components quality control, blister tests in the pharmaceutical industry,... These leak detectors offer unique features such as high sensitivity ($5 \cdot 10^{-12}$ mbar.l/s) and fast response time in spraying mode.

The ASM 182/192 series are extremely flexible and easy to operate. They provide automatic operation throughout the range from atmospheric sniffer tests, test of long gas line or tubing, large gross leak mode and ultra sensitive vacuum fine leak mode, readily available basic functions, combined digital and analogic display, advanced functions for convenience.

Compact model



Example: ASM 182 T

Console model



Example: ASM 192 T2D+

Introduction to the ASM 182/192 series

Compact model

Compact version for leak testing applications where space is limited. Compactness has always been synonymous with limited performance and poor lay out: Alcatel has challenge this belief. Transportability: the ASM 182 T/TD+ products are self-contained units which can be installed on a cart for easier manœuverability.

ASM 182 T Using its rotaty vane pump 2021SD, Alcatel designed an unmatched concept delivering high performance in a well laid out system.

ASM 182 TD+ Its well-proven concept for the roughing/backing oil-free pump (frictionless compact multi-stage roots) has been designed to achieve high roughing capacity (25 m³/h - 15 cfm) with minimum dimensions.

Console model

Comfortable workstation and several roughing configurations for extended and adapted capability.

ASM 192 T/T2 Console version ASM 182 T with extended pumping speed capability (T2) or leak testing large chamber.

ASM 192 TD+ Console version ASM 182 TD+.

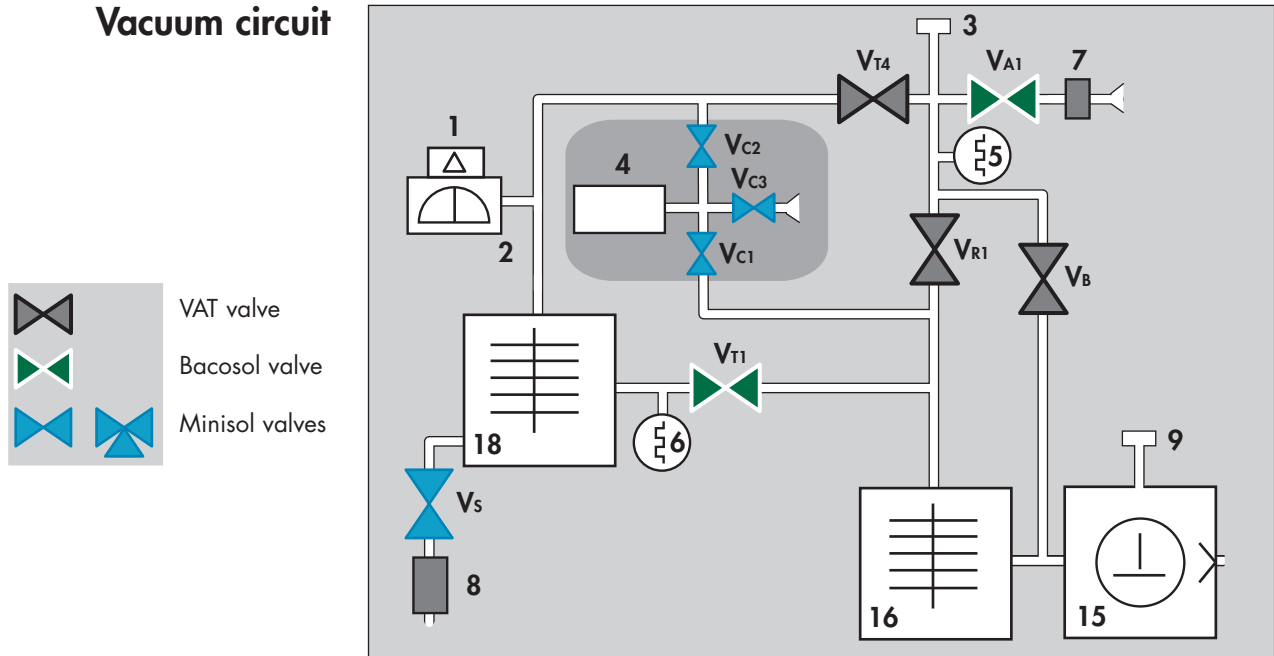
ASM 192 T2D+ Console version ASM 192 T2D+ with a extended pumping speed capability for leak testing large chambers.

THE VERSIONS ACCORDING THE DETECTOR TYPES

PUMPING	COMPACT VERSION	CONSOLE VERSION
1 Rotary vane pump RVP 2021 1 Hybrid pump TMP 5154	ASM 182 T	ASM 192 T
2 Rotary vane pumps RVP 2021 1 Hybrid pump TMP 5154		ASM 192 T with 40 m ³ /h roughing option
1 Rotary vane pump RVP 2021 1 Turbomolecular pump ATP 100 1 Hybrid pump TMP 5154		ASM 192 T2
2 Rotary vane pumps RVP 2021 1 Turbomolecular pump ATP 100 1 Hybrid pump TMP 5154		ASM 192 T2 with 40 m ³ /h roughing option
1 Dry pump Type ACP 28 1 Molecular drag pump MDP 5011 1 Hybrid pump TMP 5154	ASM 182 TD+	ASM 192 TD+
1 Dry pump Type ACP 28 1 Molecular drag pump MDP 5006 HDS 1 Turbomolecular pump ATP 100 1 Hybrid pump TMP 5154		ASM 192 T2D+

ASM 182 TD+ / 192 TD+ detector operating principle

Vacuum circuit



Reference correspondence between valve/vacuum block marks E 530

1	Preamplifier	V _{A1}	Inlet vent valve
2	Analyzer cell	V _{R1}	Roughing valve
3	Detector inlet port	V _B	By-pass valve
4	Internal calibrated leak	V _{T1}	Exhaust valve
5	Inlet pressure gauge (PI3C)	V _{T4}	Detection valve
6	Outlet pressure gauge (PI1)	V _S	Sniffing valve
7	Vent connector	V _{C2}	Calibration valve - Detection
8	Long distance sniffer connector	V _{C1}	Calibration valve - Roughing
9	Nitrogen purge connector	V _{C3}	Calibration valve - Inlet vent
15	Roughing primary pump (ACP 28)		
16	Roughing molecular pump (MDP 5011)		
18	Detection turbomolecular pump (TMP 5154)		

ASM 182 TD+ with gas line option C 420

Pumping capacities

25 m³/h (15 cfm) roughing (dry primary pump ACP 28)
+ 10 l/s (molecular drag pump MDP 5011).
Helium pumping speed at inlet port: 4.4 l/s.

Test capacities

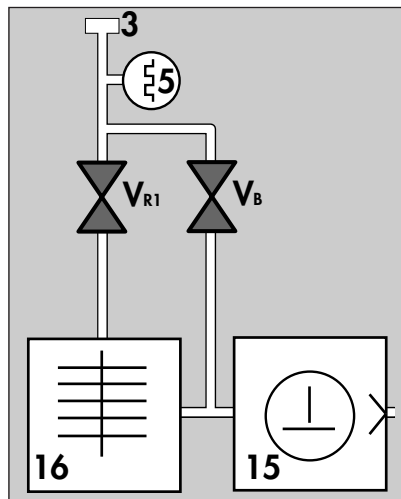
Short test cycle.
Quick response time.
Auto-calibration with integrated calibrated leak.

ASM 182 TD+ / 192 TD+ detector operating principle

**Operation in
vacuum test mode:
3 stages**

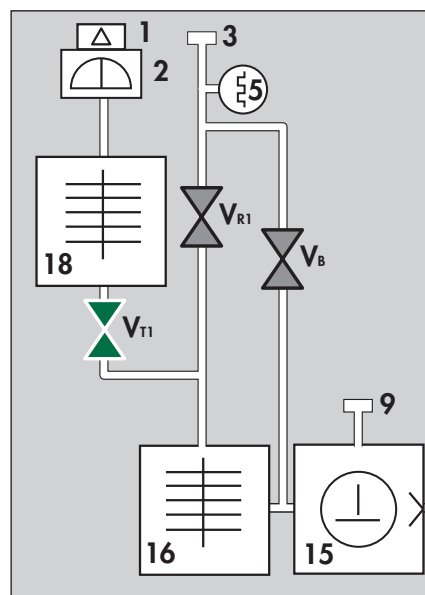
Note: Only operational parts are represented.

① Primary roughing

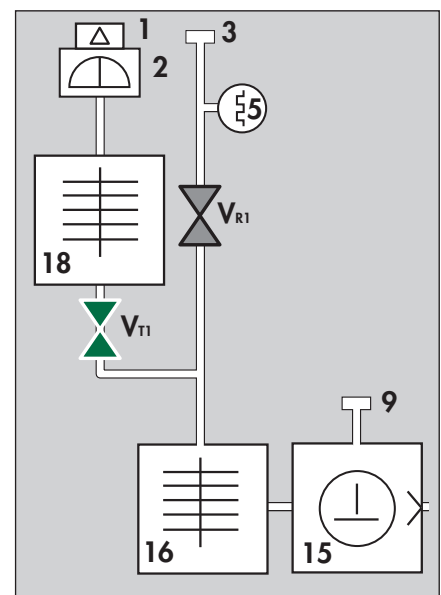


② Gross leak test mode

1 mbar < Inlet Pressure < 6 mbar



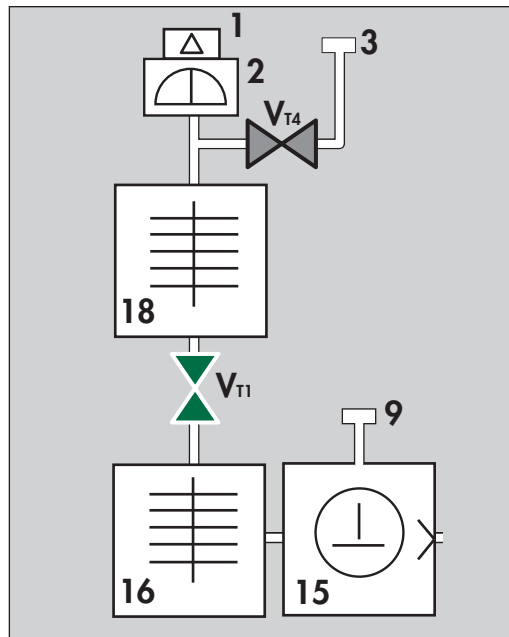
$2 \cdot 10^{-2}$ mbar < Inlet Pressure < 1 mbar



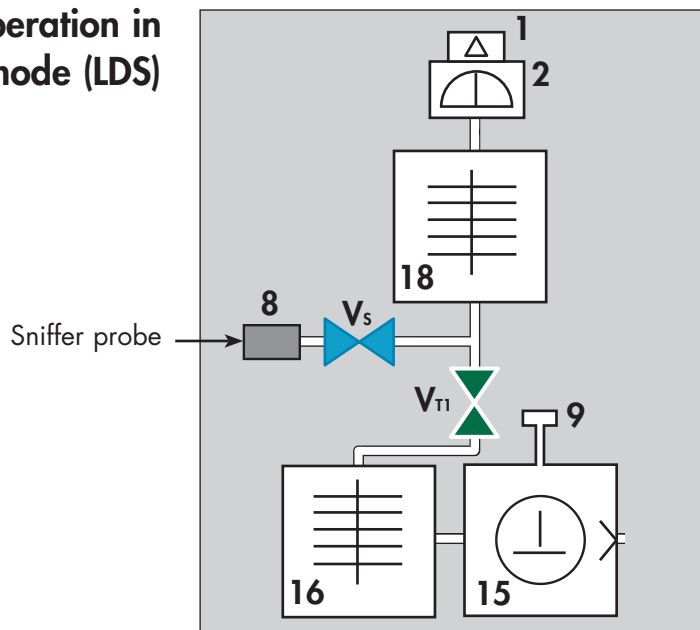
ASM 182 TD+ / 192 TD+ detector operating principle

**Operation in vacuum test mode:
3 stages
(continued)**

3 High sensitivity test mode (HS)



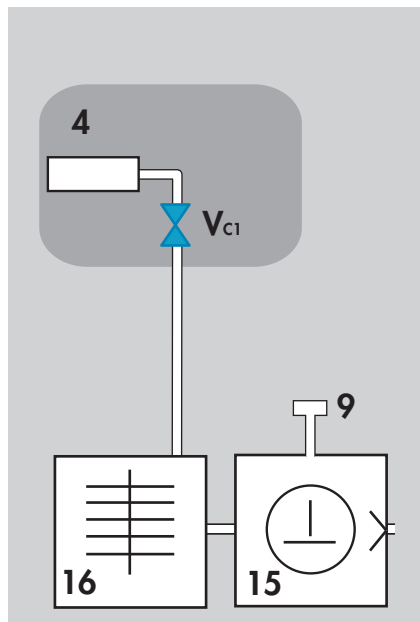
Operation in sniffing mode (LDS)



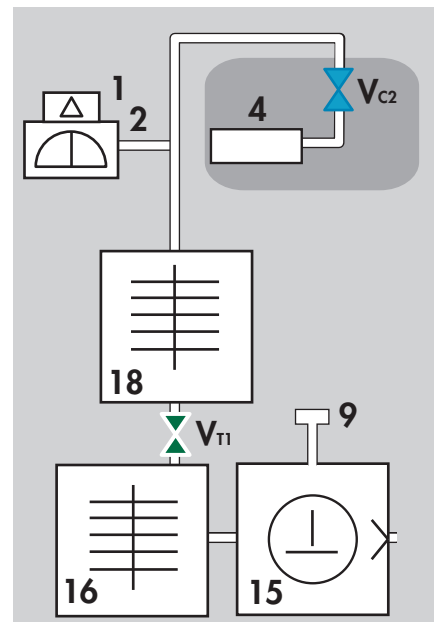
ASM 182 TD+ / 192 TD+ detector operating principle

Operation in internal calibration mode

① Roughing of calibrated leak

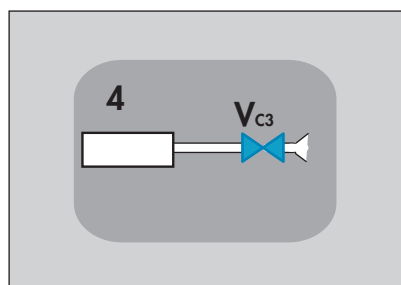


② Calibration



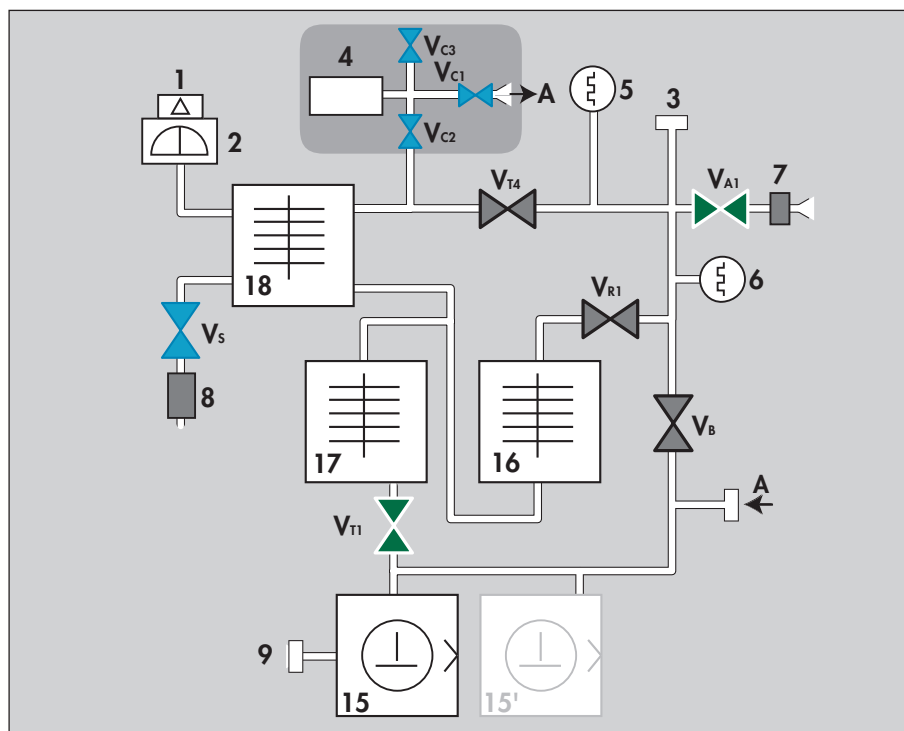
③ Venting of calibrated leak

The leak is returned to atmospheric pressure.



ASM 192 T2D+ detector operating principle

Vacuum circuit



Reference correspondence between valve/vacuum block marks E 530

1	Preamplifier	17	Roughing molecular pump (MDP 5006HDS)
2	Analyzer cell	18	Detection turbomolecular pump (TMP 5154)
3	Detector inlet port	V_{A1}	Inlet vent valve
4	Internal calibrated leak	V_{R1}	Roughing valve
5	Inlet pressure gauge (PI3C)	V_B	By-pass valve
6	Outlet pressure gauge (PI1)	V_{T1}	Exhaust valve
7	Vent connector	V_{T4}	Detection valve
8	Long distance sniffer connector	V_S	Sniffing valve
9	Nitrogen purge connector	V_{C2}	Calibration valve - Detection
15	Roughing primary pump (ACP 28)	V_{C1}	Calibration valve - Roughing
15'	Second roughing dry primary pump (ACP 28)	V_{C3}	Calibration valve - Inlet vent
16	Roughing molecular pump (ATP 100)		

Pumping capacities

27 m³/h (16 cfm) roughing (dry primary pump ACP 28) or 54 m³/h (32 cfm) + 100 l/s (turbomolecular pump ATP 100). Helium pumping speed at inlet port: 20 l/s.

Test capacities

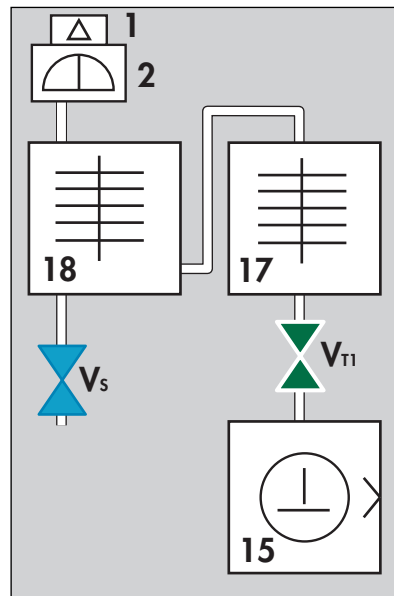
Short test cycle on big volumes.
Quick response time on big volumes.
Auto-calibration with integrated calibrated leak.

ASM 192 T2D+ detector operating principle

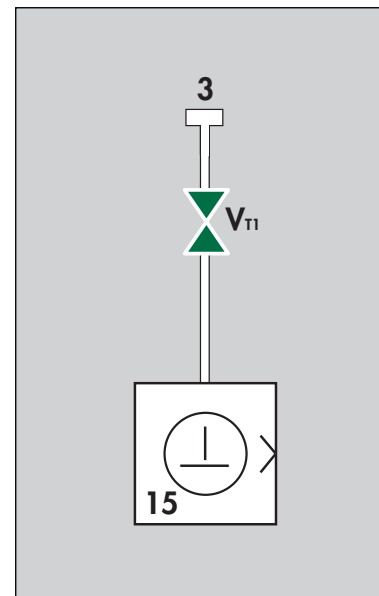
Operation in vacuum test mode

Note : Only operational parts are represented.

1 Stand by

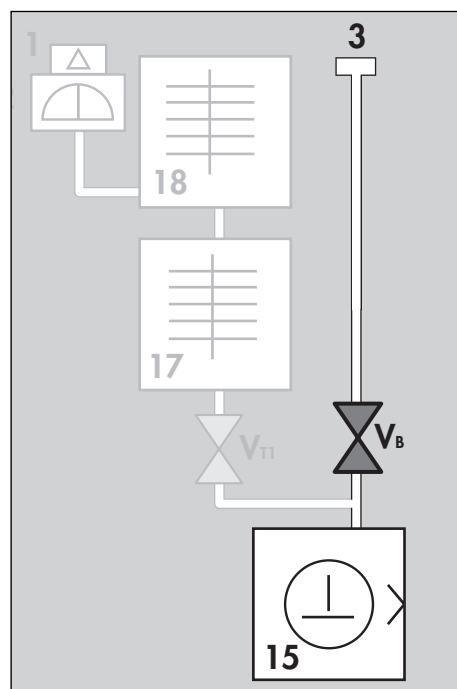


2 Primary roughing



3 Gross leak test mode

3 mbar < Inlet Pressure < 30 mbar

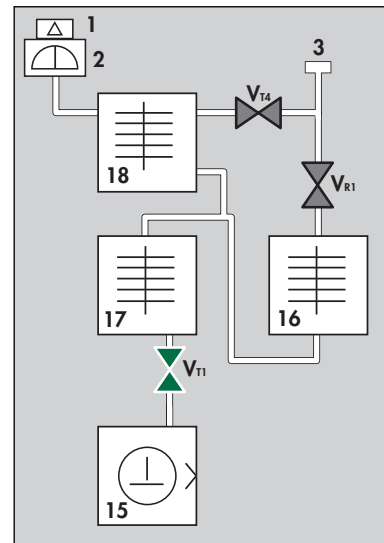
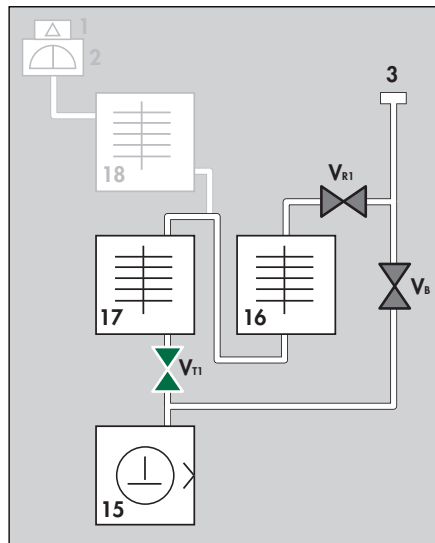


ASM 192 T2D+ detector operating principle

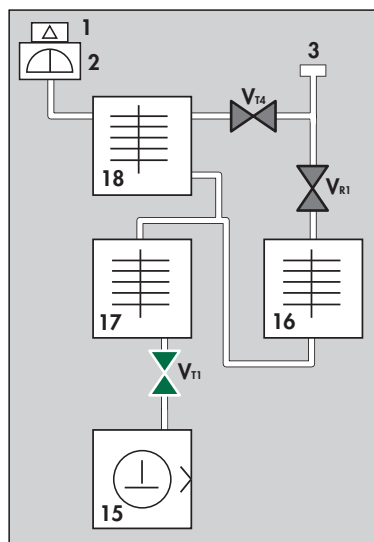
Operation in vacuum test mode (ctd)

④ Normal test mode
 $5 \cdot 10^{-1}$ mbar < Inlet Pressure
 < 3 mbar

$2 \cdot 10^{-2}$ mbar < Inlet Pressure
 < $5 \cdot 10^{-1}$ mbar

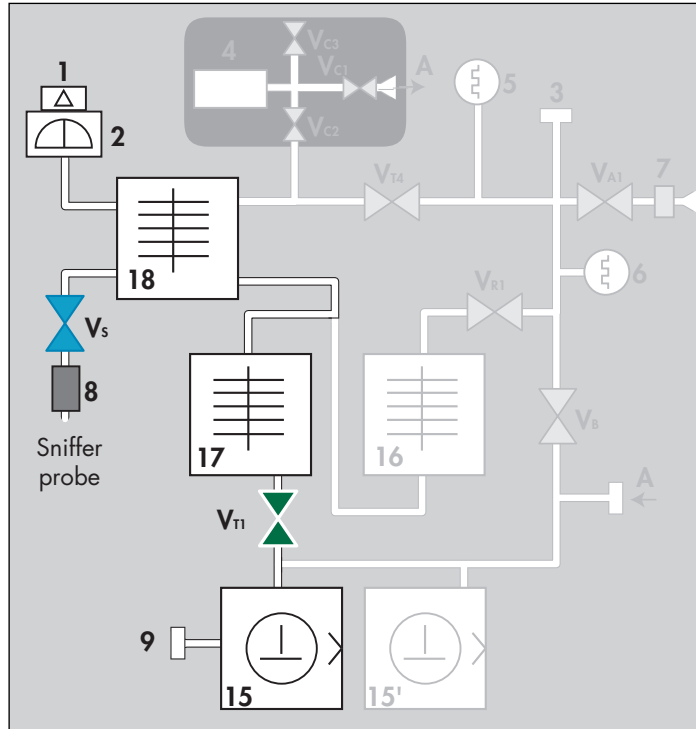


⑤ High Sensitivity test mode
 inlet pressure < $2 \cdot 10^{-2}$ mbar



ASM 192 T2D+ detector operating principle

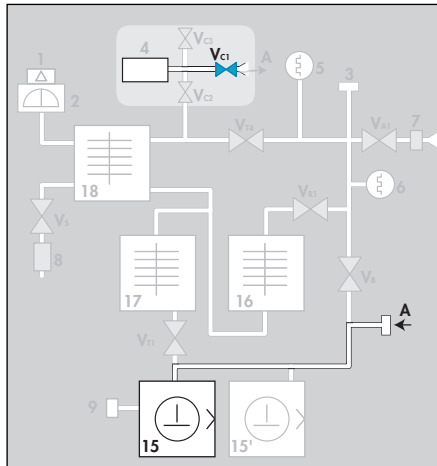
Operation
in sniffing mode
(LDS)



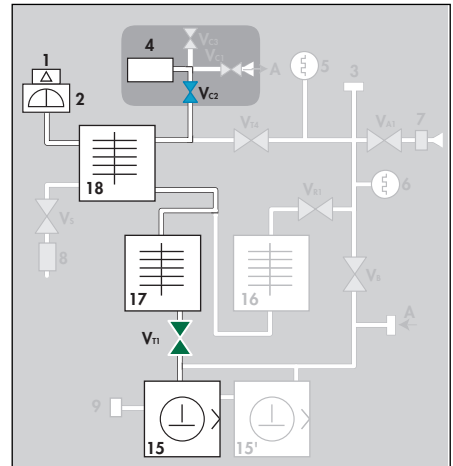
ASM 192 T2D+ detector operating principle

Operation in internal calibration mode

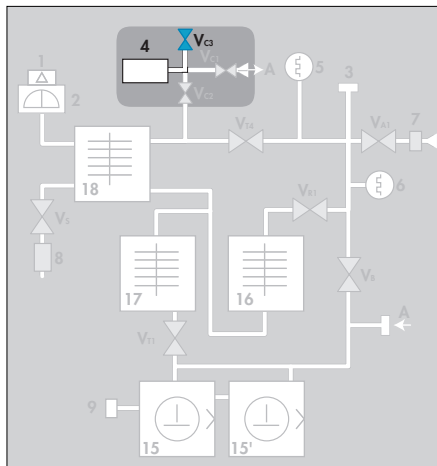
① Roughing of calibrated leak



② Calibration



③ Venting of calibrated leak

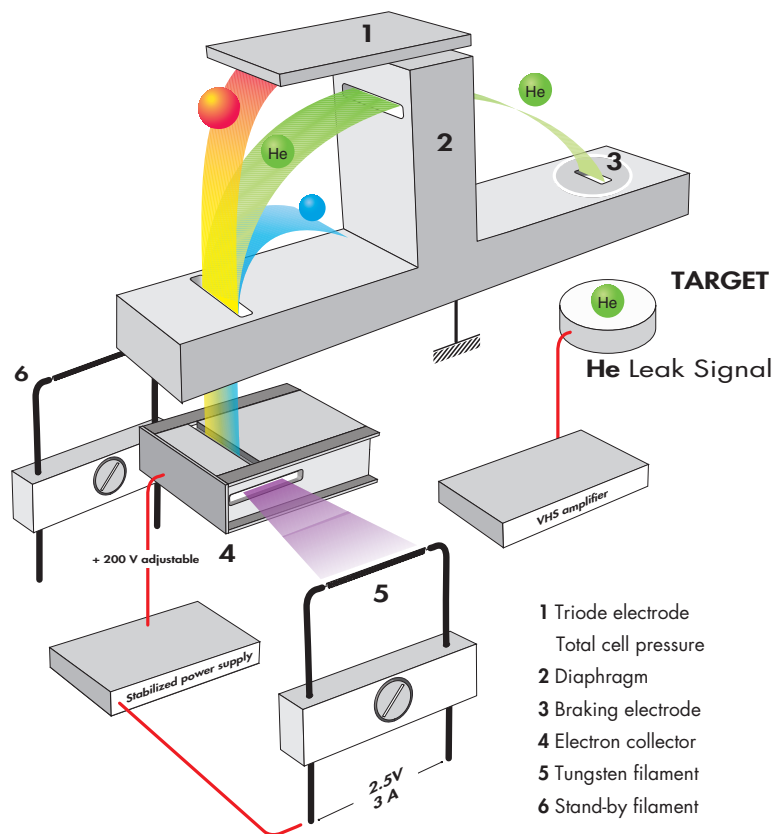


Analyzer cell operating principle

Description The analyzer cell works on the principle of mass spectrometry and is set to the mass of helium ($m/e = 4$).

m/e = atomic mass of the particle/number of electrons lost on ionization

The principle of magnetic deflexion spectrometry is as follows. The neutral molecules of the gas being analyzed pass into an ionization chamber (or source of ions) where they are bombarded by an electron beam generated by a heated tungsten filament. A large number of the molecules are transformed into ions.



 **Electrons beam**

 **"heavy" ions**

 **Helium ions**

 **"light" ions**

Analyzer cell - functional diagram

Analyzer cell operating principle

Description (continued) These ionized particles are accelerated by an electrical field.

The entire analyzer cell is subject to a magnetic field which has the property of deflecting the trajectories of the ions along different curves according to the masses of those ions (to be more precised, according to their m/e ratios). Thus the ions beam, which contained ions with different masses, is divided into several beams, each containing only ions with the same m/e ratio. The helium ions ($m/e = 4$) are separated from the lighter (H_2^+ or H_1^+ , smaller beams) or heavier ions (N_2^+ or O_2^+ , small beams).

Because there is a constant magnetic field (permanent magnet), the accelerator electrical field is adjusted so that the helium ions ($m/e = 4$) follow a pre-determined trajectory (passing through diaphragms) and arrive on the target at the input to a direct current amplifier.

The current of helium ions is proportional to the partial pressure of helium in the installation and by measuring it we can find the flow rate of the leak that has been detected.

It is essential that the total pressure in the analyzer cell is less than 10^{-4} mbar, so that the trajectories of the electrons and the ions are not disturbed by residual molecules. Around 10^{-3} mbar there is a risk of damaging the heated filament.

In order to separate the helium ions from «noise» caused by «stray ions», an electrode located in front of the target eliminates the secondary ions with low energies. This electrode is called the «braking electrode».

There is an auxiliary electrode at the top of the cell, shaped like a plate, which collects the ions that are heavier than helium. This electrode thus measures the total pressure in the analyzer. This electrode serves as the plate for a triode gauge, hence its name of «triode electrode».

Analyzer cell operating principle

Design and manufacture

Great care has been taken with the design and manufacture of the cell in order to repeatedly obtain the same characteristics and to achieve excellent stability:

- the metal parts are made of stainless steel,
- the filament holder is made of machined aluminium,
- there is an integral amplifier.

The cell assembly is composed of:

- a vacuum chamber or deflection chamber,
- an optic holder flange,
- a permanent magnet,
- an amplifier.

- **The vacuum chamber:**

The analysis cell vacuum chamber is made of light alloy. It is hollow with a rectangular opening into which the electrodes, (that are installed on the «optics holder» flange) are placed.

- **The optics holder flange:**

The optics holder flange supports all the electrodes and electrical connections in the cell. They include:

- the sealed power supply socket, mounted on a metal gasket,
- the amplifier, mounted on an elastomer gasket,
- the supporting block which screens the target and on which the source of ions is mounted,
- the source of ions, which is made up of 2 parts:
 - a filament holder,
 - an ionization chamber with a stainless steel electron collector and a mass ion emitter.

The filament holder mechanically positions the tungsten filament with respect to the ionization chamber.

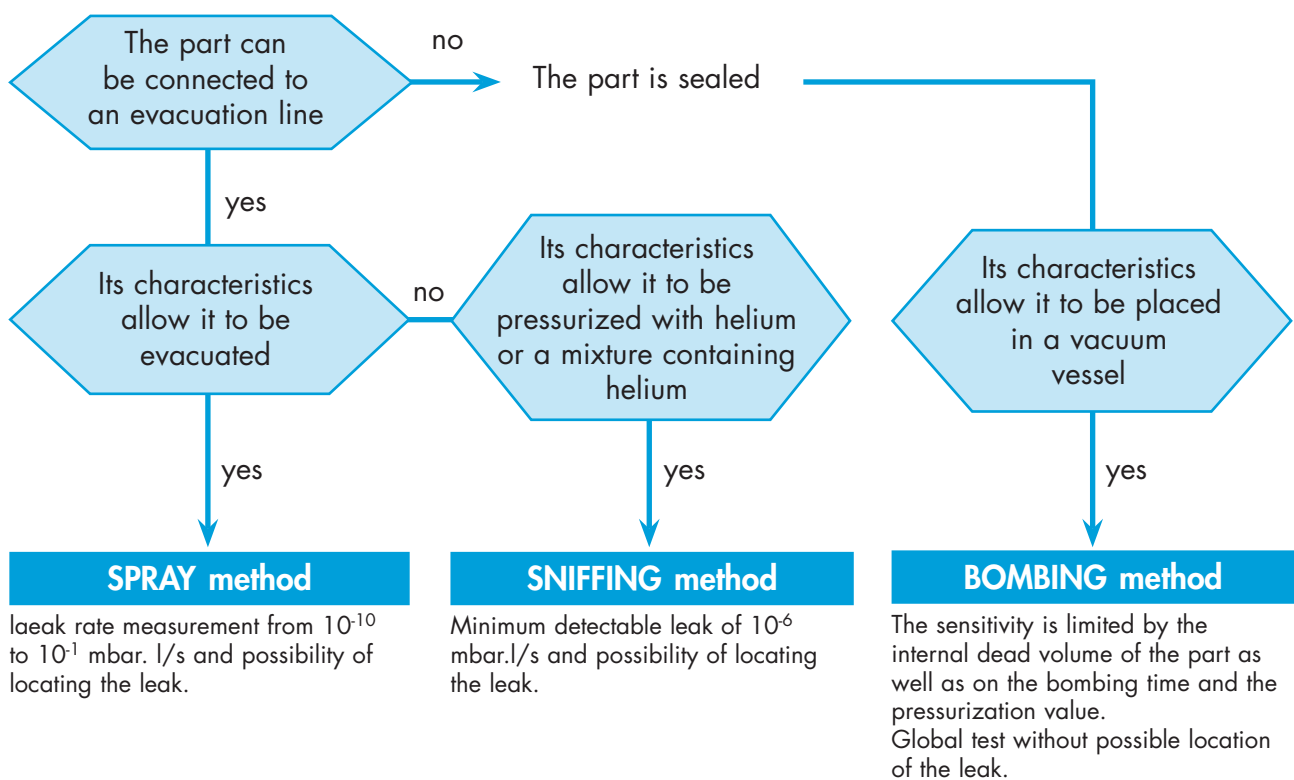
The electron collector and the filament have been designed and positioned so that the temperature of the electron collector stabilizes at 400°C under bombardment and radiation from the filament. The cell is thus rendered immune to contamination from the pieces being tested without the need of any special heating system.

Testing methods

Overview Leak detection is used to detect micro-openings, porosities, etc. in test parts. The detection of these cracks involves the use of a light tracer gas, which is capable of infiltrating the smallest leak quickly: **Helium**.

The detector samples and measures the helium flow rate entering the test part via the leak(s).

The testing method is selected according to the test part and the measurement accuracy required:



Testing methods

Helium concentration and signal displayed

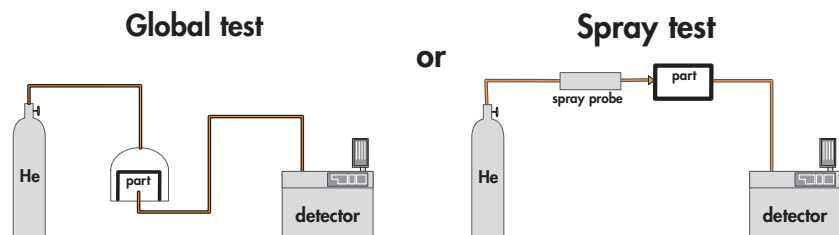
In accordance to the He concentration rate in the gas used for the leak detection, the signal displayed will change.

Example: signal displayed with a 1×10^{-7} mbar.l/s calibrated leak (with 100 % He) connected to the detector inlet.

% He in the gas used	100 %	10 %	1 %
Signal displayed on the leak detector	1×10^{-7} mbar.l/s	1×10^{-8} mbar.l/s	1×10^{-9} mbar.l/s

Spray method (inboard testing)

This involves removing air from the test part, connecting it to the analyzer and then spraying helium over the outer surface.



The part is placed under a cover, into which helium is injected.

The leak cannot be located.

The detector measures the flow of helium penetrating the part.

Potential leaking areas are sprayed with helium.

The leak can be located.

Response time

When spraying starts, the leak signal is not displayed instantaneously on the analyzer:

there is a response time which depends on the volume V being tested and the helium pumping speed S of the system at the opening of the part, according to the following relation:

$$T = V/S \quad (T \text{ in seconds, } V \text{ in litres, } S \text{ in l/s})$$

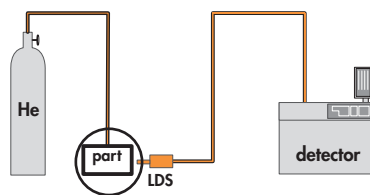
T is the time required for the signal to reach 63 % of the final value.

Testing methods

Sniffer method (outboard testing)

The test part is pressurized with helium. The detector, via an LDS (Long Distance Sniffer) probe, samples the helium escaping from the part.

Global test



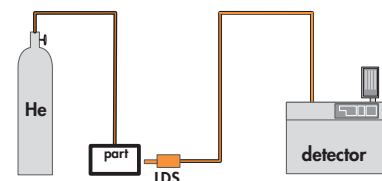
The part is placed under a cover containing a sniffer probe.

The leak cannot be located.

The helium from the leak accumulates over time inside the cover. The detector measures the concentration of helium.

Local sniffing test

or



The sniffer probe is moved over areas likely to contain leaks.

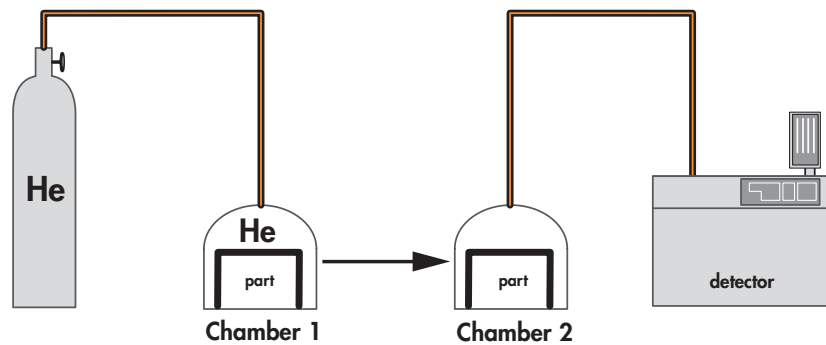
The leak can be located.

The signal supplied by the analyzer is not a direct measurement of the leak. The sniffer probe only samples part of the helium escaping from the part. The sample depends on the distance separating the leak from the tip of the probe.

Testing methods

Bombing method

This method is used for sealed objects that cannot be connected directly to the detector (semiconductors, waterproof watches, etc.).



The part is placed in a chamber containing pressurized helium.

The helium penetrates the part if it has a leak.

The part is then removed from the chamber and placed in another vacuum chamber which is connected to the detector. The helium escapes from the part through the leak and produces a signal.

This signal is not a direct measurement of the leak as the helium pressure inside the part is difficult to determine. Several parts play an important part such as: the pressurization time, the helium bombing pressure, the internal volume, the aeration time, the size of the leak.

About Helium and hydrogen

Helium Helium is the second most common element in the universe, representing about 23 % of the total matter. 76 % is Hydrogen. All other elements represent an insignificantly small fraction of the total.

Helium was discovered by spectroscopy in a solar eclipse on August 18, 1868. The discovery in the sun's chromosphere gave the new element its name: "helios" in Greek means "sun". While Helium is very common in the universe most of it is in the stars: on earth it is actually not abundant. Since it is so light all the Helium present during the formation of earth escaped to space. Helium is created deep in the earth from the radioactive decay of Uranium and Thorium which also gives the earth its internal heat. On earth Helium was discovered in 1881 by spectroscopy of Mount Vesuvio in Italy – the volcanic gases emanated by the mountain showed the same lines in the spectrum as already known from the sun.

Helium concentration in the atmosphere is 5 times bigger than the one of Krypton and 60 times higher than Xenon. The heavier noble gases are isolated from air rectification. In contrary, Helium is "mined" from natural gas and oil wells. This is economical at concentrations above 0.4%. Helium comes up with the natural gas and is separated and stored. The annual world wide production is ca. 3×10^7 m³ or 4,500 tons.

It occurs in economically extractable amounts in certain natural gases. Natural resources can be found in the USA (Texas and Kansas) and Poland. Natural Helium concentrations reach up to 7 % in natural gas.

Helium is constantly seeping up from the ground all around us, but it is so light that almost all of it escapes into space fairly rapidly. On the other hand there is a constant flow of Helium from space and the sun to earth. This gives a dynamic equilibrium and is the reason for the world wide constant concentration of ca. 5 ppm Helium in air.

Helium is a very light colorless element and it is one of the six noble gases; the most difficult gas to liquefy.

Helium is a noble gas, which means it doesn't react with anything for all practical intents and purposes. It's used as an inert shield gas to protect things from oxidation – and of course as leak detection tracer gas.

Helium is a 100 % green gas and has absolutely no environmental impact on the atmosphere.

About Helium and hydrogen

Helium and leak detection: which purity ?

Helium is commercialized in many different purity levels, the highest level of purity is requested from some laboratories for fundamental researches or very accurate analyses.

The use of the Helium as a tracer gas into a mass spectrometer doesn't require such attention. A purity in the range of 97 % to 99 % is enough .

There is absolutely no risk of accuracy lost or contamination for the cell analyzer by using standard purity level of Helium gas.

Helium (Air Liquide and Linde sources, Europe)

Purity	Average market price (2004) in €/m ³
99,9995 %	27
99,999 %	13
99,5 %	10
97,5 %	8

The gas producers as Air Liquide, Linde, Praxair, Sanfu and others push customers to use high purity level for Helium, of course, because cost and margin are higher and your mission by selling Helium leak detector solution is to inform your customers about the mass spectrometer requirement in term of helium purity.

About Helium and hydrogen

Hydrogen

Hydrogen (H₂) is the lightest element, has a gaseous specific gravity of 0.0695 and a boiling point of -423 F (-252.8 C) at atmospheric pressure. It is a colorless, odorless, tasteless, flammable gas found at concentrations of about 0.0001 % in air. Hydrogen is produced by several methods, including steam/methane reforming, dissociation of ammonia, and recovery from by-product streams from chemical manufacturing and petroleum reforming. Hydrogen can be stored and transported as either a gas or a cryogenic liquid.

Hydrogen is flammable in the concentration range 4 % to 75 % in air or oxygen and can detonate in the range 18 % to 60 % in air or oxygen .

Compared to the helium at same purity, hydrogen is less expensive than helium, but on the field the reality is different because to use Hydrogen under safe conditions you have to mix the Hydrogen with an inert gas like Nitrogen; the concentration of Hydrogen in Nitrogen must be lower than 5 % to be non-flammable in air or Oxygen.

And under this condition the price of the mixture is becoming more expensive.

Hydrogen (Air Liquide and Linde sources, Europe)

Purity	Average market price (2004) in €/m ³
99,999 %	13
99,995 %	12
99,5 %	9
Mixture 95 % N ₂ + 5 % H ₂	25 to 30

About Helium and hydrogen

Helium, Hydrogen and sensitivity

Because the Hydrogen must be used mixed at 5 % concentration with an inert gas to be safe, the sensitivity of the test drops by a factor of 20 compared to 100 % Hydrogen concentration.

■ Theoretical example

Reject point of the part to be tested: 5×10^{-5} mbar.l/s.

H₂ concentration: **100 %**

Leak to be found: 5×10^{-5} mbar.l/s.

H₂ concentration: **10 %**

Leak to be found: 5×10^{-6} mbar.l/s.

H₂ concentration: **5 %**

Leak to be found: $2,5 \times 10^{-6}$ mbar.l/s.

■ Air conditioning example

The working pressure of the system to be tested is 50 bar and the allowed loss is 2,5 g per year.

If the system is filled with R410 refrigerant gas, the maximum allowed leak in R410 at 50 bars is $2,63 \times 10^{-5}$ mbar.l/s.

■ Calculation for equivalent leak with substitute gas

Pressure test: 8 bar, gas concentration 100 %

Equivalent leak in Hydrogen (H₂): $3,32 \times 10^{-5}$ mbar.l/s.

Equivalent leak in Helium (He): $1,66 \times 10^{-5}$ mbar.l/s.

Because Hydrogen is not a safe gas, the maximum concentration of H₂ in N₂ is 5 % to be non-flammable.

With a such concentration, the leak to be found becomes 20 times lower at $1,66 \times 10^{-6}$ mbar.l/s.

■ Conclusion

To control an air conditioning system and validate with a substitute gas that the system is tight you need for the Hydrogen method a leak detector 10 times more sensitive than a Helium leak detector.

To compare sensitivity between Helium and Hydrogen, you have to compared the following information:

Leak to be found	Gas used	Leak to be displayed
$5 \cdot 10^{-5}$ mbar.l/s	Helium	$5 \cdot 10^{-5}$ mbar.l/s
	Hydrogen mixture 95 % N ₂ + 5 % H ₂	$5 \cdot 10^{-6}$ mbar.l/s

About Helium and hydrogen

And now some wrong ideas

Helium is rare Yes, it is, but helium is an inexhaustible resource from the heart of the earth.
Helium is recovered most cost-effectively from natural gas and long-term contracts guarantee access to sources in the USA, Europe and North Africa.

Helium is expensive No, because the mass spectrometer doesn't require high level purity helium to detect accurately the leaks (97,5 % is enough).

Helium (Air Liquide and Linde sources, Europe)

Purity	Average market price (2004) in €/m ³
99,995 %	27
97,5 % => helium gas tracer	8

Hydrogen is less expensive than Helium No, because to have a safe hydrogen tracer gas, you have to use mixture (95 % N₂ + 5 % H₂).

Let see the following prices:

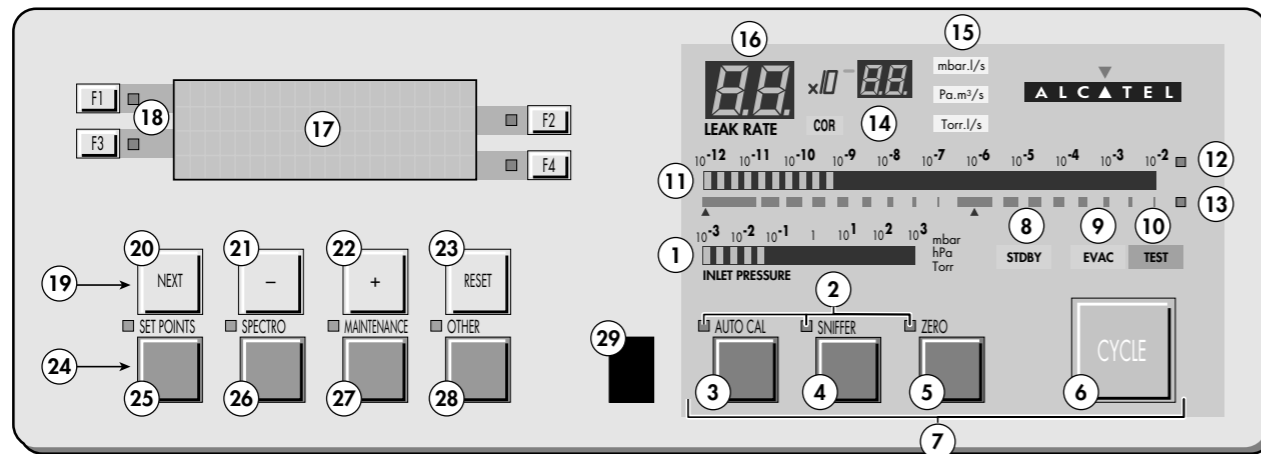
		Average market price (2004) in €/m ³
Helium	Purity: 97,5 %	8
Hydrogen	Mixture 95 % N ₂ + 5 % H ₂	25 to 30

Security: Hydrogen isn't dangerous ? No, theoretically hydrogen isn't dangerous, if ...and if...
But reality is different and if all the mixtures of H₂ + inert gas in a bottle have a limited life time, probably, the bottle isn't so safe. The reason is: because of the weight of H₂ (the lightest element), over the time a stratification phenomenon occurs which leads to gas emanation of uncontrolled Hydrogen concentration at the top of the gas bottle and can detonate or be flammable in contact of air or oxygen.

If gas producers recommendation is "always roll on the floor a mixture H₂ bottle before use", it is to avoid the stratification phenomena and to recover homogeneous mixture.

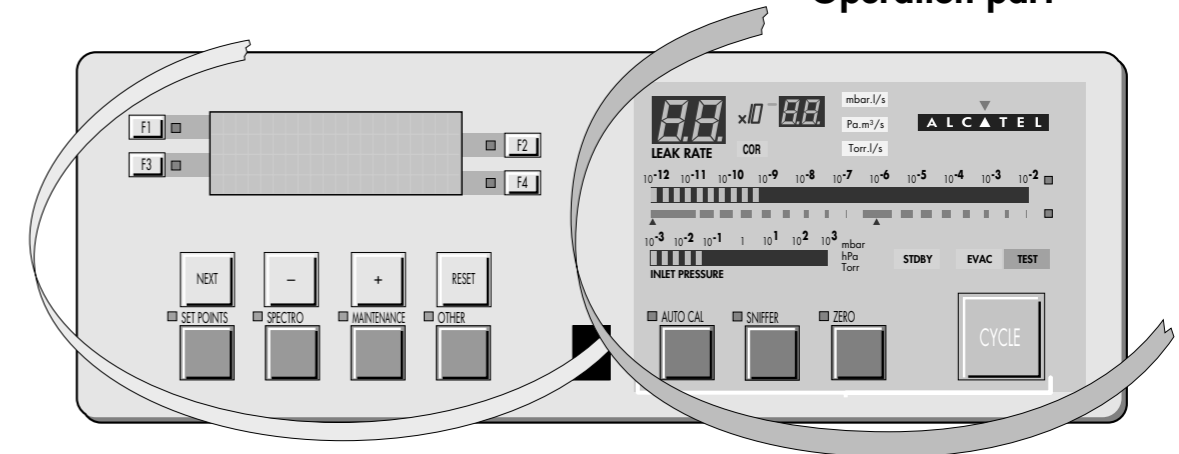
A 500

Operator interface: control panel



- 1 Inlet port pressure analog display
- 2 Control and menu selection indicators (ON when activated)
- 3 Auto-calibration START/ABORT control key
- 4 Sniffing mode ON/OFF control key
- 5 Auto-zero ON/OFF control key
- 6 Cycle START/STOP control key
- 7 Control keys (4 keys)
- 8 Standby ON/OFF indicator
- 9 Evacuation ON/OFF indicator
- 10 Test ON/OFF indicator
- 11 Helium signal analogic display
- 12 Helium signal analogic scale ON/OFF indicator
- 13 Helium signal Zero scale ON/OFF indicator
- 14 Correction factor COR indicator (applied to digital display)
- 15 Units ON/OFF indicator
- 16 Helium signal digital display
- 17 Alphanumeric display (4 lines x 20 characters)
- 18 Parameter function keys (1 key per display line)
- 19 Modification access keys (4 keys)
- 20 NEXT : next display/parameter circular function
- 21/22 Plus or minus value adjustment, parameter selection, audio volume adjustment keys
- 23 RESET of previously displayed values (cancels temporary inputs)
- 24 Menu selection access keys (4 keys)
- 25 SET POINT menu selection key
- 26 SPECTRO calibration and analyzer cell configuration menu selection key
- 27 MAINTENANCE menu selection key
- 28 OTHER menus selection key (test mode selection, inlet VENT selection, date/time)
- 29 Remote control connection

Operation part

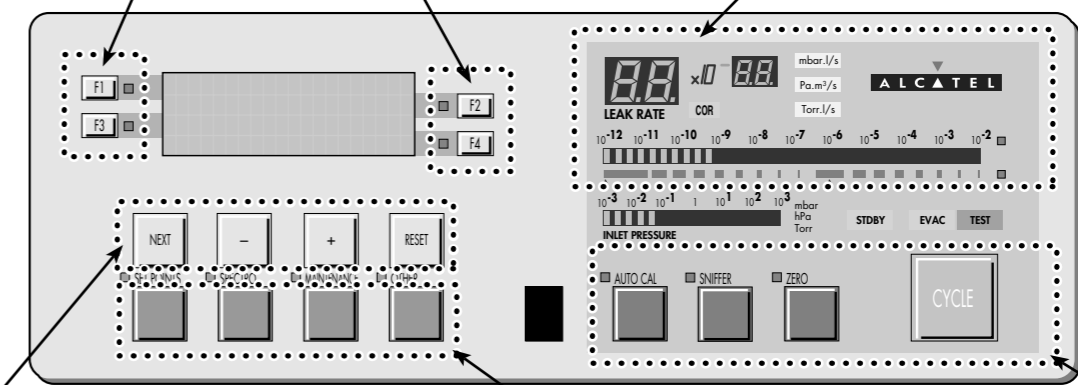


Setting and maintenance part (*)

* Operator access to setting and maintenance part depends on the user interface level.
User interface level C 120

Parameter function keys (1 key per display line)

Helium signal display



Modification access keys (4 keys)

Menu selection access keys (4 keys)

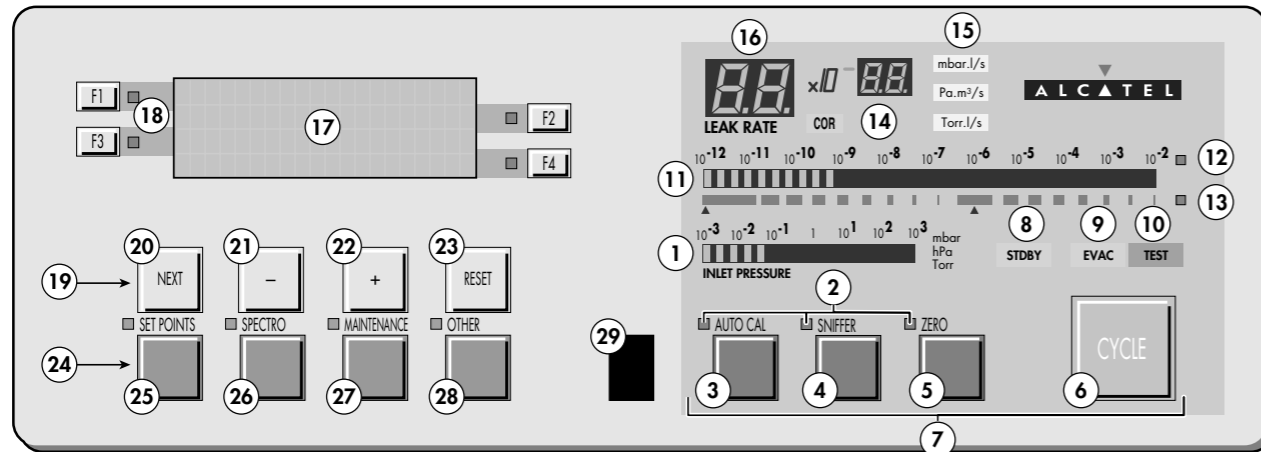
Control keys (4 keys) and control and menu selection indicators (ON when activated)

Remote control interface C 400

Control panel with graphic interface (option) C 440

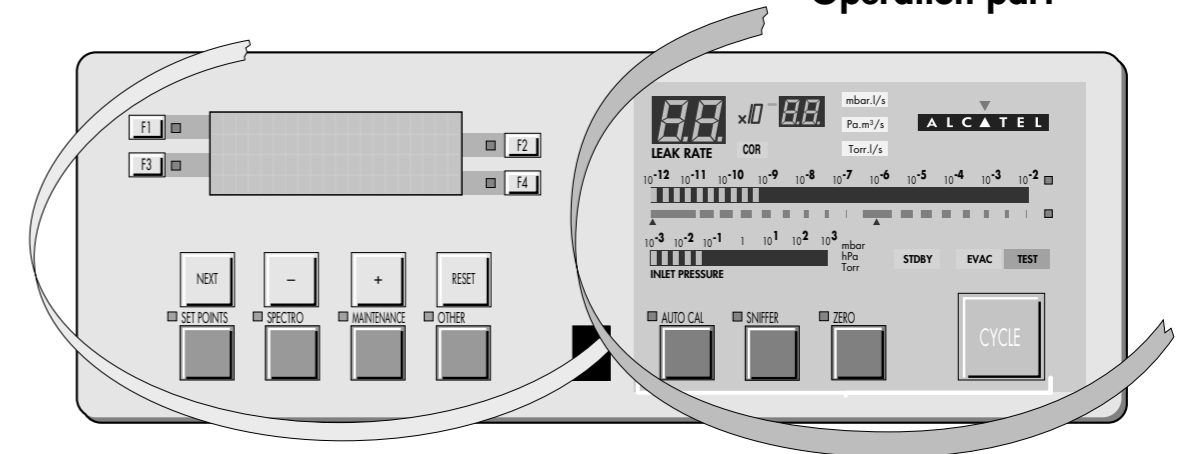
A 500

Operator interface: control panel



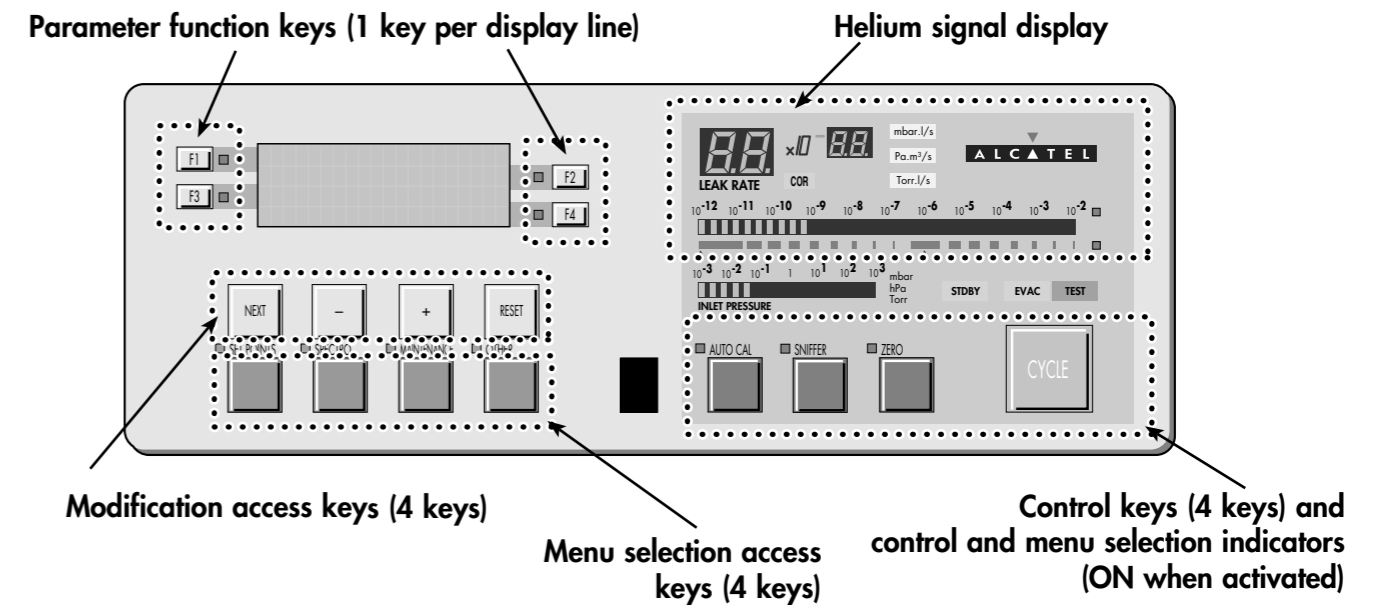
- 1 Inlet port pressure analog display
- 2 Control and menu selection indicators (ON when activated)
- 3 Auto-calibration START/ABORT control key
- 4 Sniffing mode ON/OFF control key
- 5 Auto-zero ON/OFF control key
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- 25 SET POINT menu selection key
- 26 SPECTRO calibration and analyzer cell configuration menu selection key
- 27 MAINTENANCE menu selection key
- 28 OTHER menus selection key (test mode selection, inlet VENT selection, date/time)
- 29 Remote control connection

Operation part



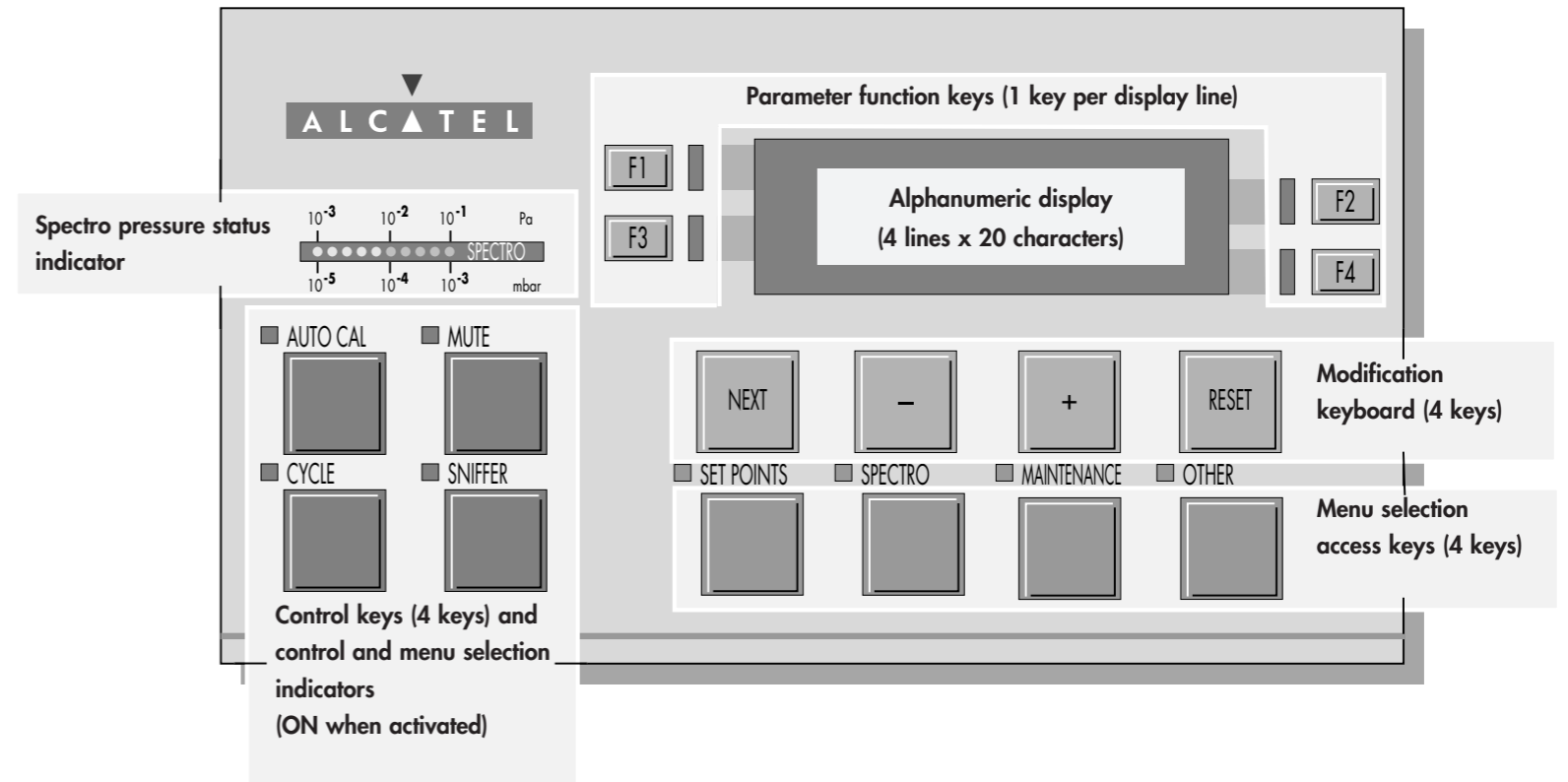
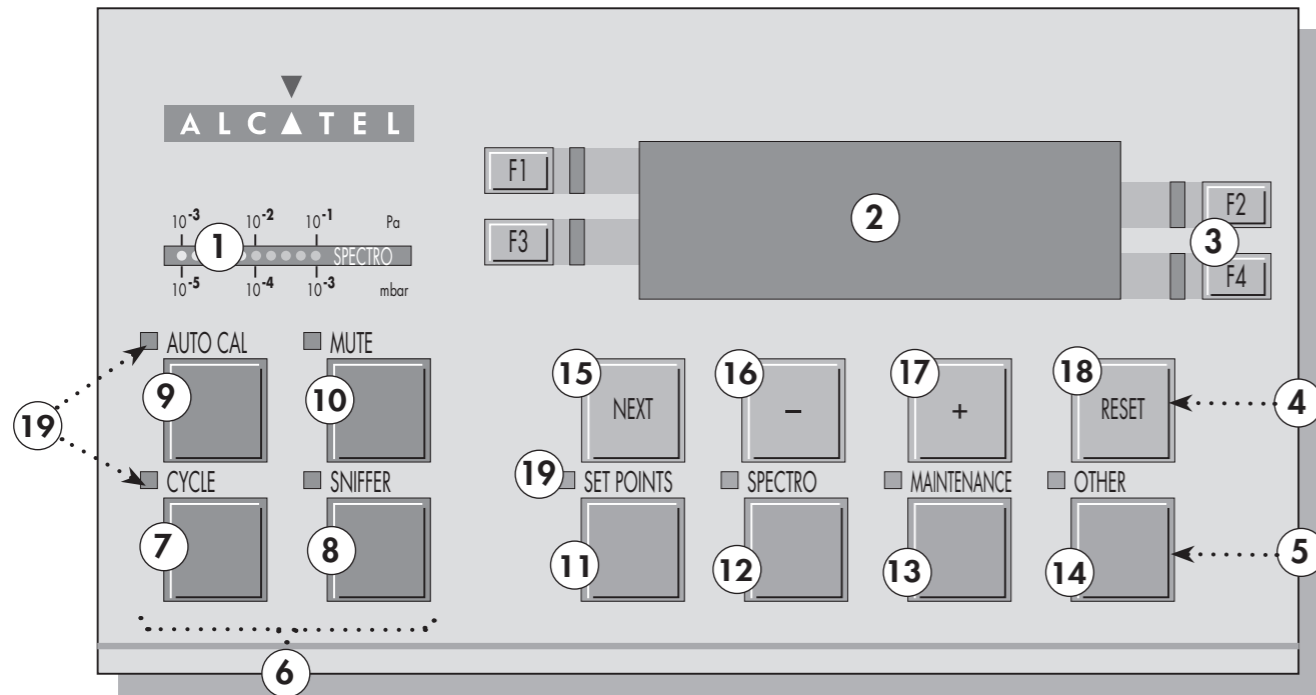
Setting and maintenance part (*)

* Operator access to setting and maintenance part depends on the user interface level. **User interface level** C 120



Remote control interface C 400
Control panel with graphic interface (option) C 440

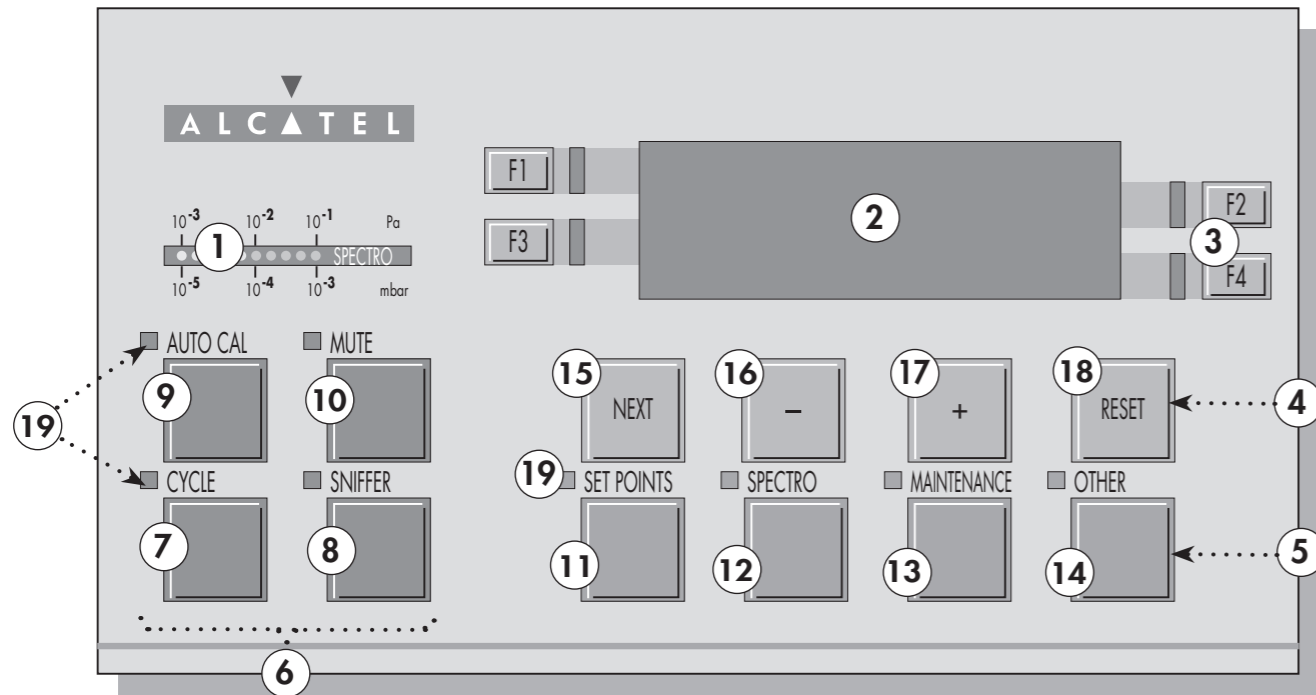
Operator interface: control panel



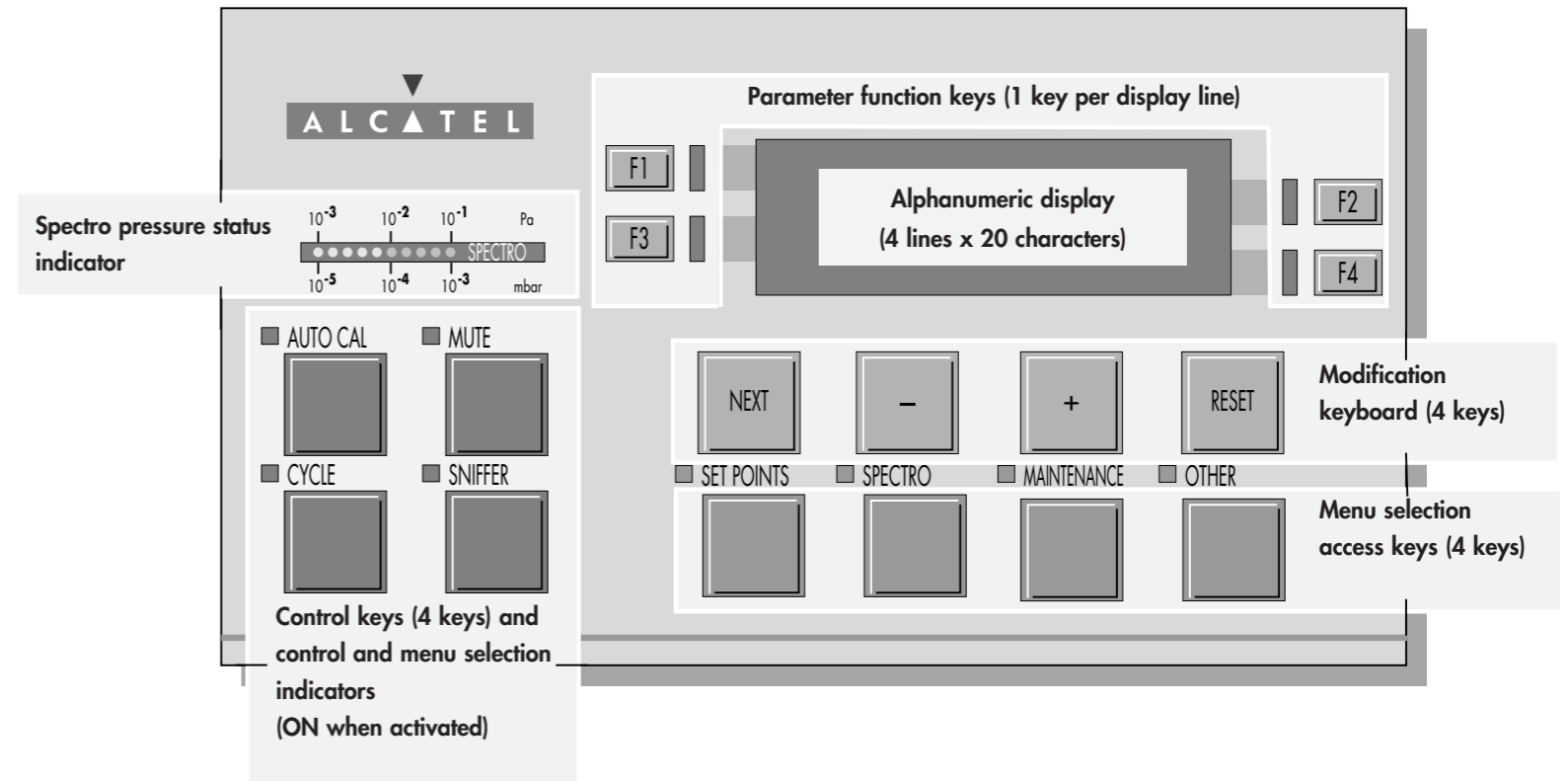
- 1 Spectro pressure status indicator
- 2 Alphanumeric display (4 lines x 20 characters)
- 3 Parameter function keys (1 key per display line)
- 4 Modification keys (4 keys)
- 5 Menu selection access keys (4 keys)
- 6 Control keys (4 keys)
- 7 Cycle Start/Stop control key
- 8 Sniffing mode ON/OFF control key
- 9 Autocalibration Start/Abort control key
- 10 Mute: Audio signal ON/OFF control key
- 11 SET POINT menu selection key
- 12 SPECTRO calibration and analyzer cell configuration menu selection key
- 13 MAINTENANCE menu selection key
- 14 OTHER menus selection key (test mode selection, inlet VENT selection, date / time)
- 15 NEXT: next display/parameter circular function
- 16 & 17 Plus or minus value adjustment, parameter selection, audio volume adjustment keys
- 18 RESET of previously displayed values (cancels temporary inputs)
- 19 Control and menu selection indicators (ON when activated)

Remote control interface  C 400

Operator interface: control panel





- 1 Spectro pressure status indicator
- 2 Alphanumeric display (4 lines x 20 characters)
- 3 Parameter function keys (1 key per display line)
- 4 Modification keys (4 keys)
- 5 Menu selection access keys (4 keys)
- 6 Control keys (4 keys)
- 7 Cycle Start/Stop control key
- 8 Sniffing mode ON/OFF control key
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- 12 SPECTRO calibration and analyzer cell configuration menu selection key
- 13 MAINTENANCE menu selection key
- 14 OTHER menus selection key (test mode selection, inlet VENT selection, date / time)
- 15 NEXT: next display/parameter circular function
- 16 & 17 Plus or minus value adjustment, parameter selection, audio volume adjustment keys
- 18 RESET of previously displayed values (cancels temporary inputs)
- 19 Control and menu selection indicators (ON when activated)



Remote control interface  C 400

Options

Which options for which model?

		ASM 102 S	ASM 122 D	ASM 142	ASM 142 S	ASM 142 D	ASM 182 T	ASM 192 T	ASM 192 T2	ASM 182 TD+	ASM 192 TD+	ASM 192 T2D+	ASM 1002
Metal seals	1		•	•		•	•	•	•	•	•	•	•
Inlet port	2		•										•
Units	3	•	•	•	•	•	•	•	•	•	•	•	•
Languages	4	•	•	•	•	•	•	•	•	•	•	•	•
3 masses	5	•	•	•		•	•	•	•	•	•	•	•
Automatic test chambers	6			•			•	•	•	•	•	•	•
Roughing system	7							•	•		•	•	
Interface board*	8			•	•	•							
Remote control cable length	9	•											
Test of gas line	10									•			
Stainless steel cover (UCT)	11									•			
Control panel with graphic interface*	12			•		•	•			•			
Transport cart*	 A 700									•			
Voltage configuration	-	•	•	•	•	•	•	•	•	•	•	•	•
Power plug	-	•	•	•	•	•	•	•	•	•	•	•	•
Remote control*	 A 700		•					•	•		•	•	•

*also available in accessories

Options

Metal seals

1

Inlet and high vacuum manifolds and the analyzer cell are equipped with metal seals instead of elastomer seals to protect the leak detector against contamination with helium. This option is particularly useful in case of high sensitivity helium leak detection in an "helium contaminated environment".

Localisation of the metal seals  F 800

Inlet port

2

ASM 122 D: The standard DN 25 inlet port can be replaced by a DN 40 inlet port for convenience.

ASM 1002: The test chamber can be replaced by a DN 25 inlet port for convenience.

Units

3

The user can choose the unit of the software: mbar.l/s, Pa.m³/s or Torr.l/s.

Languages

4

The user can choose the language of the software: English, French, German or Japanese.

Note: ASM 142 S: English/French/German/Spanish.
ASM 1002: English/French.

3 masses

5

For use of one of the 3 following tracer gases: Helium 4, Helium 3 or Hydrogen 2.

Automatic test chambers

6

This is used for the automatic bombing testing of small components. When the chamber cover is closed, the test cycle is initiated, via a contact.

3 aluminium alloy models are available:

- a hemispheric chamber, Ø 72 mm, depth 31 mm (small model),
- a cylindrical chamber, maximum Ø 85 mm and maximum depth 68 mm (medium model),
- a cylindrical chamber, maximum Ø 160 mm and maximum depth 200 mm (large model).

Note: ASM 142: large model not available.

Options

Roughing system

7

In order to reduce the roughing time when testing large volumes, a second roughing pump can be added to the roughing system:

- ASM 192 T / 192 T2 total capacity: 40 m³/h or 24 cfm.
- ASM 192 TD+ / 192 T2D+ total capacity: 50 m³/h or 36 cfm.

Apart from the roughing capacity, the weight and the power consumption, the characteristics and the use of the leak detector remain the same.

Interface board

8

The helium leak detector can be equipped with a software version which will offer a complete RS 232 protocol:

- 3 operating modes: basic, advanced, printer;
- possibility to remote control the detector (start/stop, autozero, auto-cal etc...);
- possibility to obtain and adjust the settings;
- possibility to obtain all the maintenance information for preventive maintenance purposes.

This RS 232 is the most effective interface to supervise your leak test from a PC (data recording on an Excel sheet, for instance) and/or to monitor the detector from a small PLC.

Remote control cable length

9

3 lengths are proposed: 5 m, 10 m and 15 m.

Test of gas line

10

Used to perform spray testing on long lines (typical diameter 1/4"), with a reduced response time due to the transfer of the helium by a carrier gas injected in viscous flow.

In this case, the detector is equipped with an additional 1/4" VCR connector specific to this option.

Stainless steel cover (UCT)

11

Designed for use of the unit in clean rooms ("Ultra Clean Technology").

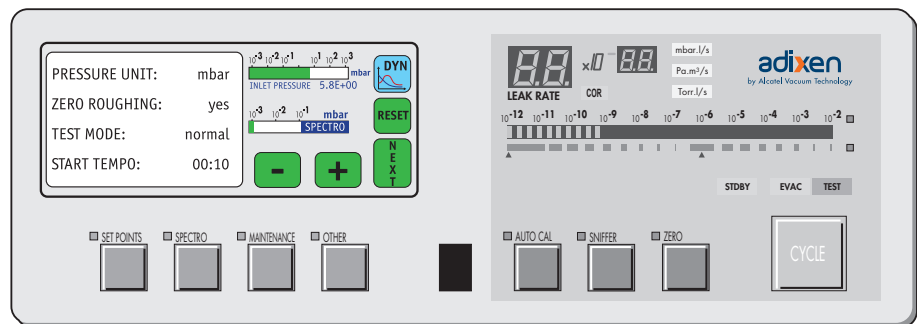
The front and rear covers and frame are made of stainless steel.

Options

Control panel with graphic interface



12

The control panel with graphic interface is equipped with a color touch screen. It allows it to have, as a supplement to the standard control panel functions, a graphic interface.



Accessories

Which accessories for which model?

		ASM 102 S	ASM 122 D	ASM 142	ASM 142 S	ASM 142 D	ASM 182 T	ASM 192 T	ASM 192 T2	ASM 182 TD+	ASM 192 TD+	ASM 192 T2D+	ASM 1002
Remote control and cable*	1	•	•	•	•	•	•	•	•	•	•	•	•
Long distance sniffer (LDS) probe	2	•	•	•	•	•	•	•	•	•	•	•	•
10 m/30 feet LDS extension	3	•	•	•	•	•	•	•	•	•	•	•	•
Headphone connector (required interface board)	4			•	•	•	•	•	•	•	•	•	•
Transport cart*	5			•	•	•	•			•			
Foot pedal for cycle command (1.5 m/ 5 feet)	6						•	•	•	•	•	•	•
Calibrated helium leaks	7	•	•	•		•	•	•	•	•	•	•	•
Calibration accessory	8	•											
Spray probe	9	•	•	•	•	•	•	•	•	•	•	•	•
Interface board* (p/n 107657)	 A 600			•	•	•							
Inlet adaptor	10												•
Printer	11												
Inlet filter	12		•	•		•	•	•	•	•	•	•	•
Short distance sniffer probe	13		•	•		•	•	•		•	•		•
Bombing chamber	14		•	•		•	•	•	•	•	•	•	•
Test chambers	15		•	•		•	•	•	•	•	•	•	•
Neutral gas vent line kit	16			•									
4 swiveling wheels kit	17							•	•		•	•	
Covered sniffer probe and remote control kit	18				•								
Bottle handle for cart	19									•			
Control panel with graphic interface* (p/n 111716)	 A 600			•		•	•			•			

*also available in options

Accessories

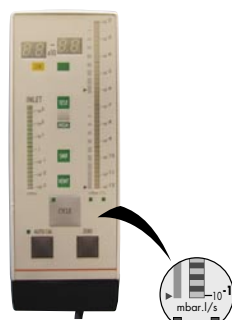
Remote control

1



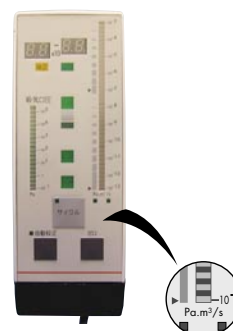
The remote control is equipped with a magnet allowing the operator to place it on a magnetized surface. The operator can read the helium signal and has access to control keys such as cycle command auto-calibration and auto-zero.

English serigraphy



mbar.l/s
or Torr.l/s
or Pa.m³/s

Japanese serigraphy

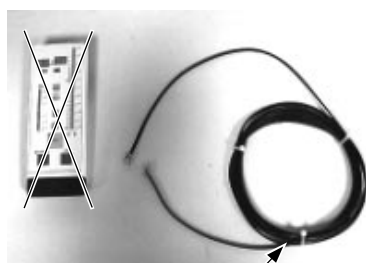


Pa.m³/s
only

Remote control with 5 m/15 feet cable length:

Model	Part No
Unit: mbar.l/s - Front face in English	106 688
Unit: Torr.l/s - Front face in English	108 881
Unit: Pa.m ³ /s - Front face in English	108 880
Unit: Pa.m ³ /s - Front face in Japanese	106 690

Note: The remote control is delivered in standard with the ASM 192 series and ASM 122 D.



Cable only

Cable for remote control (remote control not provided):

Designation	Part No
Cable of 10 m/394"	101 881
Cable of 15 m/591"	101 882
Cable of 20 m/797"	802 494
Cable of 25 m/984"	802 339
Cable of 30 m/1181"	802 767
Cable of 35 m/1378"	802 768
Cable of 40 m/1575"	802 769
Cable of 45 m/1772"	802 770
Cable of 50 m/1969"	802 771

Accessories

Long Distance Sniffer probe

2

Sniffer probe with a rigid nipple

Sniffer probe with a flexible nipple

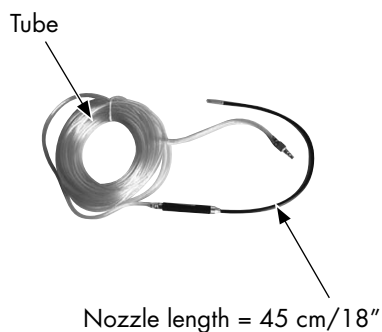


LDS probe part number	5 m canalisation				10 m canalisation			
	Rigid nipple		Flexible nipple		Rigid nipple		Flexible nipple	
	9 cm	30 cm	15 cm	45 cm	9 cm	30 cm	15 cm	45 cm
	SNC1E1T1	SNC1E2T1	SNC1E3T1	SNC1E4T1	SNC2E1T1	SNC2E2T1	SNC2E3T1	SNC2E4T1



Long distance sniffer with short rigid nozzle:

Designation	Part No
Tube length 20 m/787"	802 826
Tube length 30 m/1181"	802 827
Tube length 40 m/1575"	802 828
Tube length 50 m/1969"	802 829
Tube length 60 m/2362"	802 830
Tube length 70 m/2756"	802 831
Tube length 80 m/3150"	802 832
Tube length 90 m/3543"	802 833
Tube length 100 m/3937"	802 834



Long distance sniffer with long flexible nozzle:

Designation	Part No
Tube length 20 m/787"	802 835
Tube length 30 m/1181"	802 836
Tube length 40 m/1575"	802 837
Tube length 50 m/1969"	802 838
Tube length 60 m/2362"	802 839
Tube length 70 m/2756"	802 840
Tube length 80 m/3150"	802 841
Tube length 90 m/3543"	802 842
Tube length 100 m/3937"	802 843

Accessories

10 m/30 feet LDS extension

3

Used to extend the LDS probe by 10 m/30 feet.
Part No: **090216**

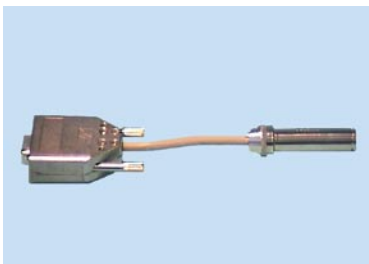


Headphone connector

4

With the headphone connector, the operator can connect a headphone to its detector.

Part No: **A459818**



The headphone connector is an accessory but to use it, the detector must be equipped with the interface board option.

Which headphone used  C 410

Transport cart

5

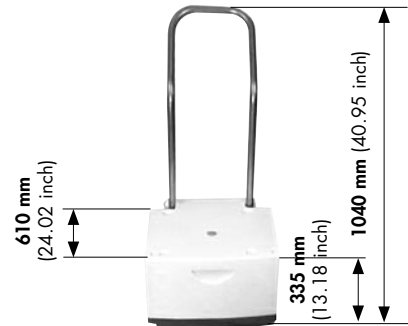
ASM 182 range
Part No: **111196**



Accessories

Transport cart (ctd)

ASM 142 range
It can be fixed to the detector.
Part No: **108068**



ASM 142 range
In addition to the standard cart (p/n 108068), a 4 wheels stainless steel cart is proposed for 142 series.
Part No: **802862**



Foot pedal for cycle command (1.5 m/ 5 feet)

Part No: **100913**

6



Accessories

Calibrated Helium leaks

7

There are several types of calibrated leaks, with or without reservoir, with or without valve, covering several leak ranges. The choice of the appropriate external calibrated leak depends on the application requirements. For further information on the ALCATEL calibrated leaks, please refer to our product catalog or consult your local ALCATEL sales engineer. Most of the ALCATEL calibrated leaks are delivered with a calibration certificate.



Helium 3 and Hydrogen calibrated leaks

ALCATEL does not supply the calibrated leaks in Helium 3 and Hydrogen.

Principle

All ALCATEL calibrated leaks are based on permeable membrane technology.

Recalibration

Most calibrated leaks last many years even though the helium is permanently escaping (the leak rate is very small in comparison to the amount of helium contained in the reservoir: yearly loss is indicated on the calibrated leak identification label). However, it is recommended to have every calibrated leak (with reservoir) recalibrated on regular intervals to validate its value: this is applicable for both internal and external calibrated leaks.

Recalibration period of the calibrated leak depends on its leak rate value.

Recommendation for proper Quality Control:

THE RECALIBRATION INTERVALS SHOULD NOT EXCEED 2 YEARS.

Please consult your local Alcatel Sales representative for additional information.

Calibration accessory

8

Used to connect the calibrated leak and the sniffer probe for a calibration.

Model	Part No
DN 16	110 715
DN 25	110 716

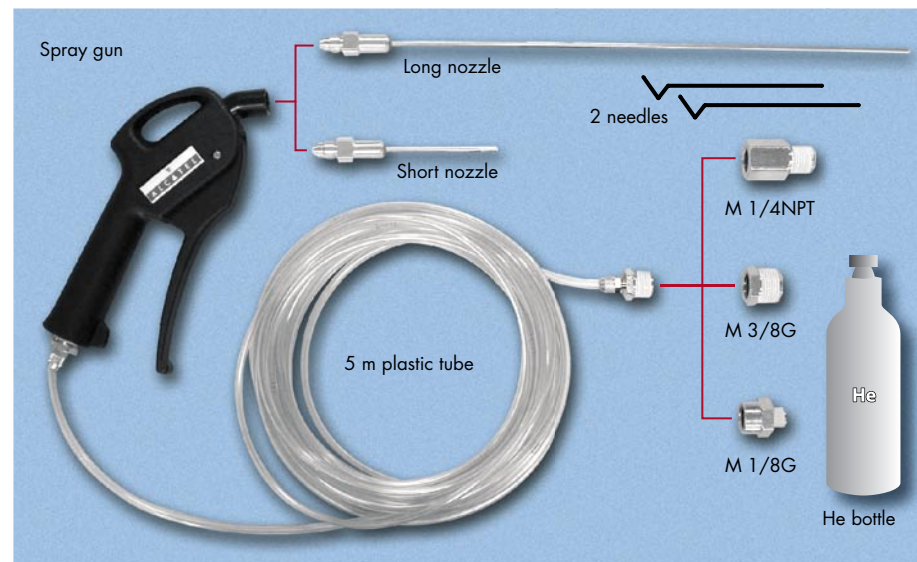


Accessories

Spray probe

9

Helium spray probe.
Part No: **109951**



Spraying Helium in order to detect a leak is usually very easy, especially if you need fast and rough detection.

Spraying Helium could also become a technical challenge when you need to pinpoint very fine leaks, more so, when they are located in areas with difficult access.

The Helium spray gun is an easy to use and multipurpose tool which allows you to work in various conditions of test:

- Multi standard: thanks to the 3 different adapters to be connected to the Helium bottle (M 1/4 NPT, M 3/8G and M 1/8G)
- Multi purpose: thanks to the 2 nozzle lengths of 80 mm / 3.14 inch and 290 mm / 14.4 inch
- Standard leak mode: for quick and rough leak tests
- Fine leak mode.

The Helium spray gun is provided with 2 standard needles which allow the adjustment of the Helium flow at the outlet of the nozzle.

Inlet adaptor

10

Adaptor plug is necessary to connect the calibrated leak to the inlet part (test chamber) of the detector.
Part No: **067791**

Printer

11

ALCATEL does not supply the printers. The printer should be connected to the leak detector and have the following characteristics:

- RS232 serial type
- 40 columns minimum.

Accessories

Inlet filters

12



Designation	DN Flange	Part No
70 µm stainless steel mesh filter	16	072 721
70 µm stainless steel mesh filter	25	072 857
70 µm stainless steel mesh filter	40	067 636
20 µm inlet filter	25/25	105 841
20 µm inlet filter	40/40	105 842
20 µm inlet filter	40/25	105 843
5 µm inlet filter	25/25	105 844
5 µm inlet filter	40/40	105 845
5 µm inlet filter	40/25	105 846
20 µm inlet filter	Ø 114 mm	105 847
5 µm inlet filter	Ø 114 mm	105 848
O'ring, Ø 5 mm	Ø 114 mm	082 152

Short distance sniffer probe (to be connected to the inlet part of a leak detector):

Temperature coefficient: 7 % per °Celsius.

Standard leak rate: $2 \cdot 10^{-4}$ mbar.l/s

Able to measure helium concentration inside water or liquids.

13



Designation	DN Flange	Part No
Sniffer probe with membrane, DN 40 flange and a 1.5 meter tube (5 ft)	40	067 683
Sniffer probe with membrane, DN 40 flange	40	067 677
Sniffer probe with membrane, DN 25 flange	25	103 592
Sniffer probe with membrane and 14 mm O.D. smooth tube connection	Ø 14 mm	067 678

Accessories

Bombing chamber

14	Designation	DN Flange	Part No
	Bombing chamber 10 bars (Ø 150 - L 200 - Vol. : 3.5 l)	-	786 396
	Bombing chamber 25 bars (Ø 150 - L 200 - Vol. : 6.4 l)	-	786 397
	Adaptator DN 25 to USA 1 1/8 OD tube	25	795 716
	Adaptator DN 40 to USA 1 1/8 OD tube	40	067 890

Test chambers (required interface board)

- small test chamber : hemispherical test chamber, Ø 72 mm, depth 31 mm
- medium test chamber : cylindrical test chamber, Ø 85 mm, depth 68 mm

- | 15 | Designation | Part No |
|----|---|---------|
| | • large test chamber : cylindrical test chamber, Ø 160 mm, depth 100 mm | |



Designation	Part No
Small test chamber DN 25 (1)	802 452
Small test chamber DN 40 (2)	802 453
Small test chamber DN 50 (3)	802 454
Medium test chamber DN 25 (1)	802 455
Medium test chamber DN 40 (2)	802 456
Medium test chamber DN 50 (3)	802 457
Large test chamber DN 40 for ASM 182 T/TD+	802 458
Large test chamber DN 40 for ASM 192 T/TD+	802 459
Large test chamber DN 50 for ASM 192 T2/T2D+	802 460

- (1) ASM 142 - ASM 142 D - ASM 122 D
 (2) ASM 122 D - ASM 182 T/TD+ - ASM 192 T/TD+
 (3) ASM 192 T2/T2D+

Accessories

Neutral gas vent line kit

Part No: **801421**

16



Neutral gas vent line kit

4 swiveling wheels kit (Ø 125 mm)

Soft wheel : improve the mobility

Customers have the possibility to lock 1, 2, 3 or 4 wheels independently.

17

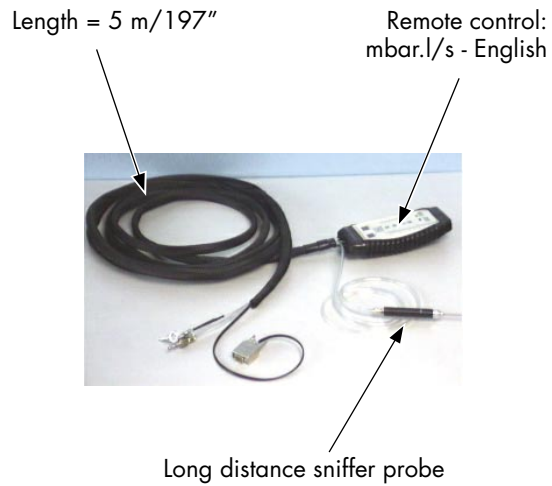
Part No: **801846**



Accessories

Covered sniffer probe and remote control kit

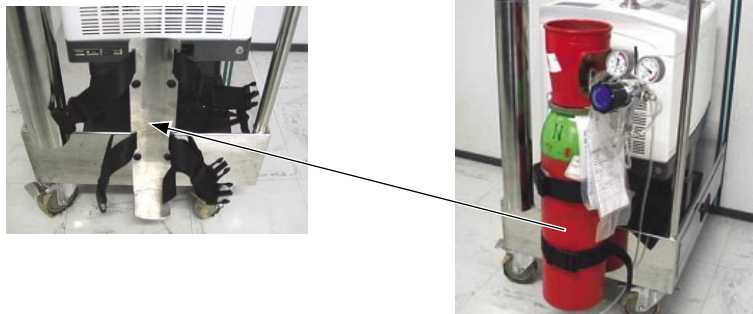
18



Part No: **802844**

Bottle handle for cart

19



Bottle handle for cart p/n 111196
Part No: **802819**

ASM 182 / 192 TD+

Technical characteristics

	Measurement range (Helium)		Crossover pressure (at inlet)	
	mbar.l/s	Pa.m ³ /s	mbar	Pa
Gross leak test mode	1.10 ⁻⁸ to 1.10 ⁻¹	1.10 ⁻⁹ to 1.10 ⁻²	6	600
High sensitivity test mode	1.10 ⁻¹¹ to 3.10 ⁻⁴	1.10 ⁻¹² to 3.10 ⁻⁵	2.10 ⁻²	2
Sniffing test mode	1.10 ⁻⁷ to 1.10 ⁻¹	1.10 ⁻⁸ to 1.10 ⁻²	sniffer probe at atm. pressure	
Response time (Inlet port blanked off)				< 0.1 s

Helium pumping speed:

At inlet port	4.4 l/s
---------------	---------

Roughing (primary) pump characteristics:

Hybrid (primary) pump pumping speed (in air)	25 m ³ /h (15 cfm) + 10 l/s
--	--

Hybrid turbomolecular pump characteristics:

Hybrid turbomolecular pump pumping speed (in air)	110 l/s
Hybrid turbomolecular pump exhaust pressure safety limit	6 mbar

Analyzer cell (Spectro):

Analyzer cell design	self protected 180° magnetic deviation mass spectrometer
Analyzer cell filament	2 tungsten filaments
Analyzer cell sensitivity	3.10 ⁻⁴ A/mbar
Emission current range	0.2 to 2 mA
Air pumping speed	110 l/s
Helium pumping speed	30 l/s

ASM 182 / 192 TD+ Technical characteristics

Displays and setpoints adjustments:

Inlet port pressure display range	10^3 to 10^{-3} mbar / 10^5 to 10^{-1} Pa
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Audio alarm:

90 dB modulated and adjustable audio signal

Hard vacuum Audio signal set point	$1 \cdot 10^{-19}$ to $9.9 \cdot 10^{19}$
Sniffing Audio set point	$1 \cdot 10^{-19}$ to $9.9 \cdot 10^{19}$

Start-up time (at 20 °C)

Without auto-calibration	< 4 min \pm 10 %
With auto-calibration	< 5 min 30 s \pm 10 %

Time to reach test mode (Hard vacuum test):

	inlet port blanked-off	connected to 1.6 l volume	connected to 60 l volume
Gross leak test mode	2 s	< 6 s	< 1 min 20 s
High sensitivity test mode	4 s	< 20 s	< 3 min 20 s

Miscellaneous:

Power frequency	low voltage:	100 - 130 V \pm 10%
	high voltage:	200 - 240 V \pm 10%
Power frequency		50/60 Hz single phase
Power consumption (maximum)		1,5 kVA
Start-up temperature		10 to 40° C
Ambient operating temperature		10 to 40° C
Storage temperature (standard detector)		-25° C to 70° C
Storage temperature (ASM 182 TD+ equipped with the graphic interface control panel)		-20° C to 60° C max. 48 h at -20° C max. 168 h at 60° C
Humidity (ASM 182 TD+ equipped with the graphic interface control panel)	$T_a \leq 40^\circ \text{C}$	$T_a > 40^\circ \text{C}$
	85 % relative humidity max.	Absolute humidity must be lower than the humidity of 85 % relative humidity at 40° C (43,4 g/m ³ in the air)
Noise level (at 1 meter; audio alarm not operational, stand by mode)		65 dBA
House protection level		20 IP
Inlet		DN 40
Hygrometry max. (at 40 °C)		95 %
Weight	ASM 182 TD+ :	88 kg
	ASM 192 TD+ :	195 kg

ASM 192 T2D+ Technical characteristics

	Measurement range (Helium)		Crossover pressure (at inlet)	
	mbar.l/s	Pa.m ³ /s	mbar	Pa
Gross leak test mode	1.10 ⁻⁵ to 1	1.10 ⁻⁶ to 1.10 ⁻¹	30	3000
Normal test mode	1.10 ⁻⁹ to 1.10 ⁻¹	1.10 ⁻¹⁰ to 1.10 ⁻²	3	3000
High sensitivity test mode	1.10 ⁻¹¹ to 3.10 ⁻⁴	1.10 ⁻¹² to 3.10 ⁻⁵	2.10 ⁻²	2
Sniffing test mode	1.10 ⁻⁷ to 1.10 ⁻¹	1.10 ⁻⁸ to 1.10 ⁻²	sniffer probe at atm. pressure	
Response time (Inlet port blanked off)	< 0.1 s			

Helium pumping speed:

At inlet port	20 l/s
---------------	--------

Roughing (primary) pump characteristics:

Hybrid (primary) pump pumping speed (in air) (1 ACP 28 version)	27 m ³ /h (16 cfm) + 10 l/s
Hybrid (primary) pump pumping speed (in air) (2 ACP 28 version)	54 m ³ /h (32 cfm) + 10 l/s

Analyzer cell (Spectro):

Analyzer cell design	self protected 180° magnetic deviation mass spectrometer
Analyzer cell filament	2 tungsten filaments
Analyzer cell sensitivity	3.10 ⁻⁴ A/mbar
Emission current range	0,2 to 2 mA
Air pumping speed	110 l/s
Helium pumping speed	30 l/s

Displays and setpoints adjustments:

Inlet port pressure display range	10 ³ to 10 ⁻³ mbar / 10 ⁵ to 10 ⁻¹ Pa
-----------------------------------	---

Audio alarm:

100 dB frequency modulated and adjustable audio signal

Hard vacuum Audio signal set point	1.10 ⁻¹⁹ to 9.9.10 ¹⁹
Sniffing Audio set point	1.10 ⁻¹⁹ to 9.9.10 ¹⁹

ASM 192 T2D+ Technical characteristics

Start-up time (at 20 °C):

Without auto-calibration	3 min 30 s ± 10 %
With auto-calibration	5 min ± 10 %

Time to reach test mode (hard vacuum test):

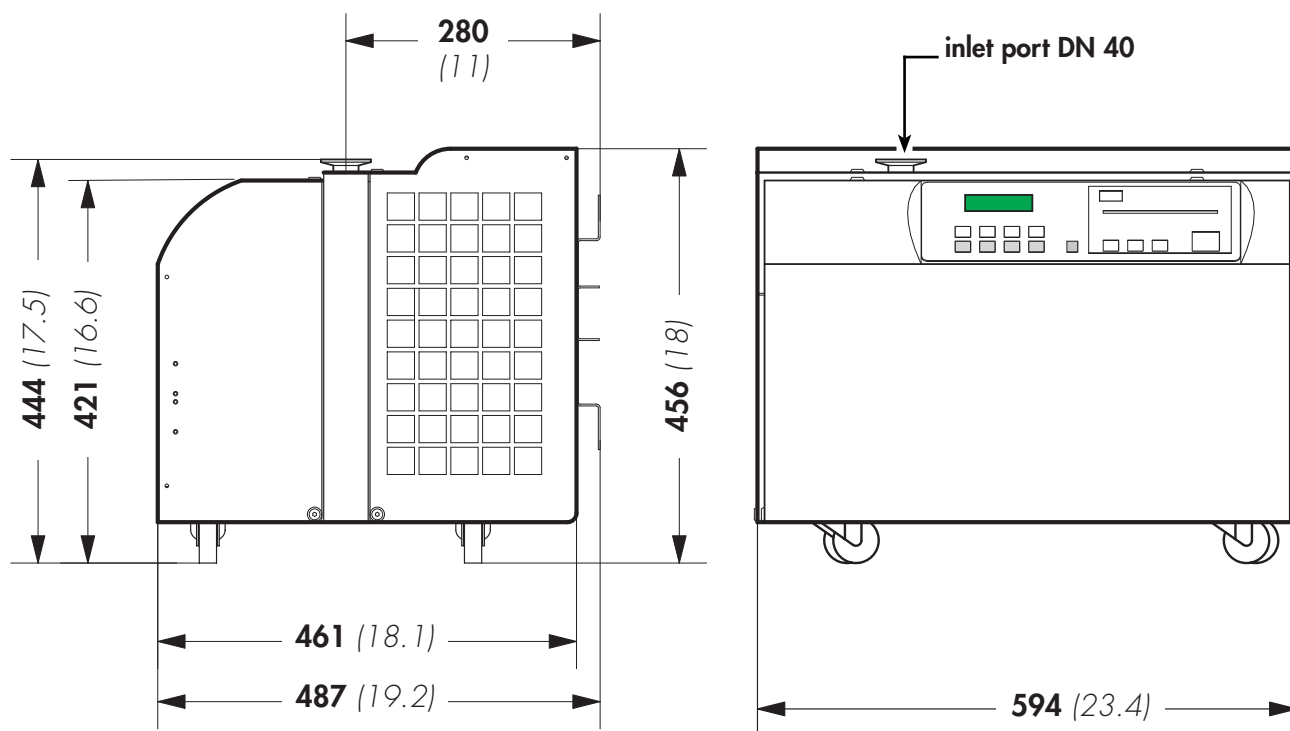
Volume	46 l		200 l		1000 l	
	Standard	2 ACP 28 Option	Standard	2 ACP 28	Standard	2 ACP 28 Option
Gross leak	43 s	23 s	2 mn 59 s	1 mn 32 s	6 mn 40 s	6 mn 21 s
Normal	1 mn 2 s	33 s	4 mn 25 s	2 mn 18 s	16 mn	9 mn 41 s
High sensitivity	1 mn 31 s	54 s	6 mn 30 s	3 mn 48 s	25 mn 35 s	16 mn 44 s
Residuel at 1.10 ⁻⁸	1 mn 51 s	1 mn 16 s	8 mn 20 s	5 mn 42 s	31 mn 7 s	22 mn 7 s
Residuel at 2.10 ⁻⁹	2 mn	1 mn 24 s	8 mn 56 s	6 mn 24 s	31 mn 1 s	24 mn 4 s

Miscellaneous:

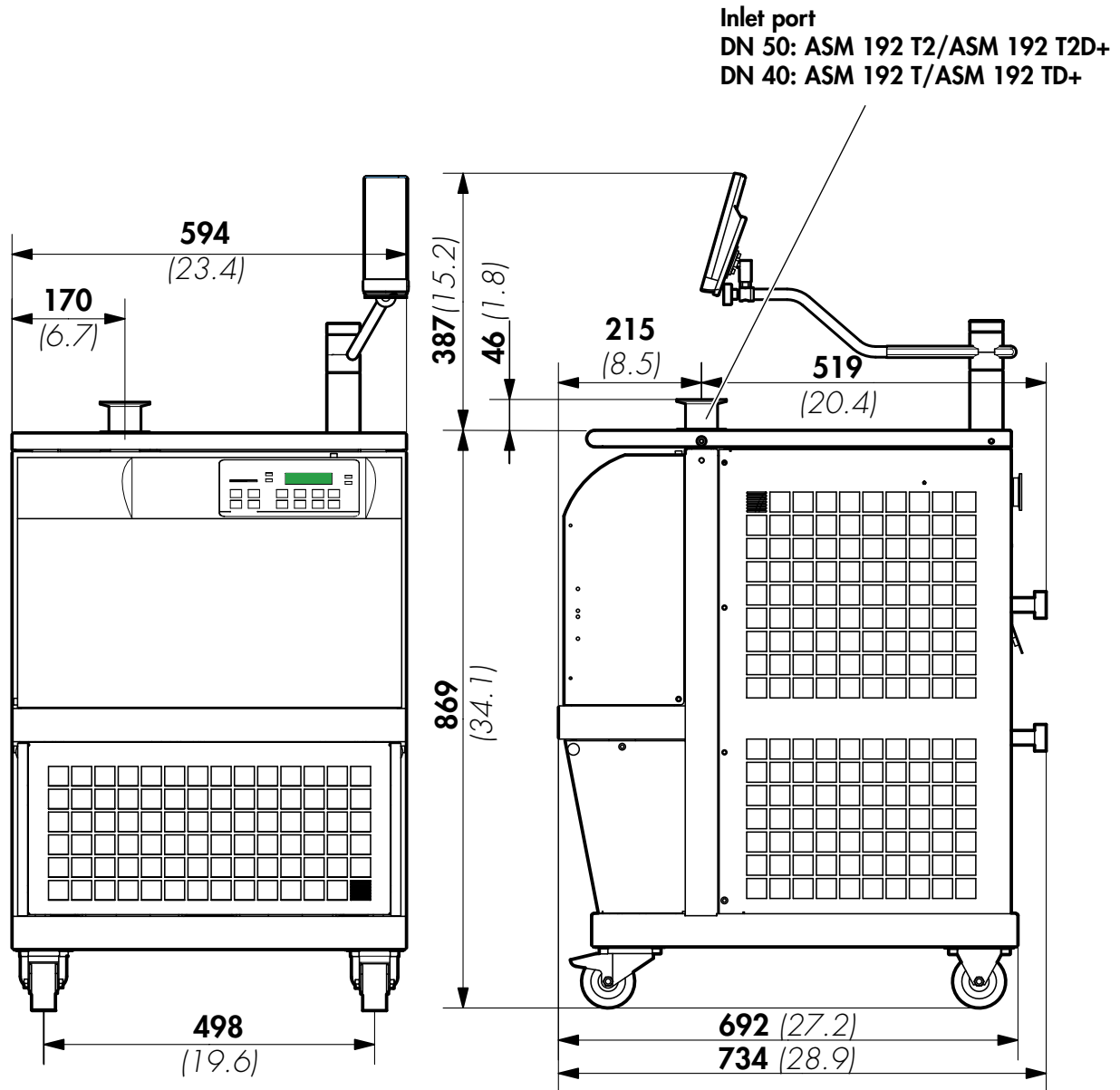
Power voltage	low voltage:	100 - 130 V ± 10%	
	high voltage:	200 - 240 V ± 10%	
Power frequency	50/60 Hz single phase		
Power consumption*		1 ACP 28 Version	2 ACP 28 Version
	maximum at roughing (delay 1 sec.):	1.5 kVA	2.3 kVA
	stabilized at roughing (max.):	1 kVA	1.9 kVA
	stabilized in test mode or in standby mode:	0.8 kVA	1.3 kVA
Start-up temperature	10 to 40° C		
Ambient operating temperature	10 to 40° C		
Storage temperature (standard detector)	-25° C to 70° C		
Noise level (at 1 meter; audio alarm not operational, stand by mode)	66 dBA		
House protection level	20 IP		
Inlet	DN 50		
Hygrometry max. (at 40°C)	95 %		
Weight	1 ACP 28 version:	157 kg	
	2 ACP 28 version:	190 kg	
Part to be tested weight max.	30 kg		

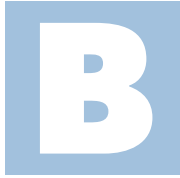
*Average power consumption for a cycle on a 200 liters volume to obtain 1.10⁻⁸ mbar.l/s.

Dimensions (mm/inch) ASM 182 TD+




Dimensions (mm/inch) ASM 192 series





Installation

ASM 182 TD+ - ASM 192 TD+ - ASM 192 T2D+ User's Manual Detailed contents

Preliminary remarks Throughout this User's Manual, you could find this type of message "Summary of screen  C 140": it refers to a specific chapter of the User's Manual. Please read it for further information.

B 100

Safety instructions

- Generalities
- Pump labels
- Leak detector labels
- Alcatel contact in case of emergency

B 110

Unpacking - Storage - Transportation

- Unpacking
- Handling the leak detector with a hoist and slings
- Precautionary measures for the leak detector installation
- Storage

B 200

Neutral gas purge and inlet vent connection

- Products concerned
- Connection to the leak detector
- Use
- Gas characteristics

B 210

ASM 182 - Connecting the detector to the installation

B 211

ASM 192 - Connecting the detector to the installation

B 300

Controlling the detector with the I/O interface

- Purpose of the I/O interface
- Location of the I/O interface
- Prepare the connector wiring
- The controls (inputs)
- The signals (outputs)
- 24 V DC Power supply

B 310

Controlling the detector with a PC computer through the RS 232 interface

- Purpose of the PC computer interface
- Location of the RS 232 interface
- RS 232 interface instructions
- Commands available for your leak detector



Installation

ASM 182 TD+ - ASM 192 TD+ - ASM 192 T2D+
User's Manual

Detailed contents

B 320

Connecting the detector directly to a printer or another device

- Purpose of the printer interface
- Location of the printer interface
- Connector description
- Communication mode description
- Connection to the printer
- Tickets available

B 400

ASM 182 series - Before starting up the leak detector

- Check power voltage
- Installation
- Check the oil level of the rotary vane pump (ASM 182 T)

B 401

ASM 192 series - Before starting up the leak detector

- Check power voltage
- Check the oil level of the rotary vane pump (ASM 192 T/T2)
- Remote control support installation

Safety instructions

Generalities

- Our products are designed to comply with current EEC regulations. Any modification of the product made by the user is liable to lead non-compliance with the regulations, or even to put into doubt the EMC (ElectroMagnetic Compatibility) performance and safety of the product. ALCATEL declines any responsibility for such operations.
- The EMC performance of the product is obtained on the condition that the installation complies with the EMC rules. In particular, in disturbed environments, it is essential to:
 - use shielded cables and connections for interfaces,
 - stabilize the power supply line with meshing from the power supply source to a distance of 3 m from the product inlet.



Risk of toppling: although the products comply with ECC regulations, it is important to take precautions to avoid toppling during handling, installation and operation.



Certain detectors are fitted with oil pumps: the oil load needed for pump operation is in separate cans. We also recommend that the user drains the pump before re-shipping the equipment.



When relevant, remove the protection which blocks the outlet of the pump, on the rear of the leak detector. We recommended connecting this outlet to a gas evacuation circuit for the oil seal pump. This circuit should have as little excess pressure as possible (less than 0.3 bar).



Storage of the equipment: our equipment can be stored without special precautions for up to 3 months (room temperature between 5°C and 40°C). For longer periods, factors such as humidity content, temperature, salty atmosphere, etc., can cause damage to certain «sensitive» parts (elastomer seals, lubricant, etc.).



Check the pumping conditions of the detector: the leak detectors are not equipped for pre-pumping of corrosive gases, condensable vapours of liquids, even in small quantities.

Safety instructions

**CAUTION**

Alcatel can not take any responsibility or apply any warranty on a leak detector which is used with a presence of corrosive or dangerous gases: all our leak detectors are not designed to pump dangerous substances.

**WARNING**

A helium leak detection operation must be made in a safe environment for the user and the equipment: all precautions must be taken by the user of the leak detector in that respect (especially to eliminate the presence of chemicaly, aggressive, toxic or hazardous substance prior to the test operation). Alcatel has no control over the types of gases passing through the pumps.

**CAUTION**

Ensure that parts or enclosures connected to the inlet of the detectors can handle a pressure drop of 1 bar relative to atmospheric pressure.

**CAUTION**

If the detector rotates in an axis perpendicular to the axis of rotation of the secondary pump, there is a risk of seizure of the secondary pump.

**WARNING**

When the device is switched off, avoid touching the pins of the mains plug. Residual voltages due to filter capacitors can provoke an electrical shock.

**WARNING**

*When the main electrical switch on the detector is set to «0», the part supply between the power plug and the main switch remains energized.
Risk of electrical shock in case of contact.
Disconnect main electrical cable before servicing.*

**WARNING**

*Hazardous voltage enclosed.
Voltage or current hazard sufficient to cause shock.
Disconnect and lockout power before servicing.
Any intervention must be done by trained personnel only.*

**WARNING**

*When the leak detector is switched off, internal parts (monitoring, frequency converter) contain capacitors charged with over 60 VDC and remain energized.
Electrical shock may result in severe injury.
Wait 5 minutes after switching off before opening the leak detector.*

Safety instructions



Other located hazardous energies: Nitrogen purge, pressurized hazardous energies. Release pressure before servicing, disconnect the gas line quick connector and turn off the pressure regulator by turning the knob counter-clockwise.

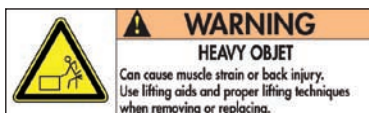


Operating conditions may generate temperatures justifying particular attention on the part of the user (external surfaces > 70°C on exhaust connections). Contact may cause burns. Always use gloves before servicing.

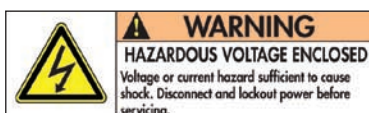
Pump labels



Located on the rear of the pump, this label warns the user against possible risk of injury due to any hand contact with hot surfaces. It states that protective gloves should be used before performing any intervention.

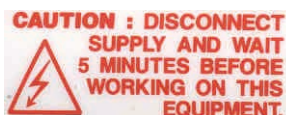


Located on the upper cover, this label indicates that due to its heavy weight, the product should not be handled manually, but always through appropriate handling devices.



Located on the upper cover, this label indicates that some of the internal parts are energized and could cause electrical shocks in case of contact. It advises to disconnect the pump before any intervention or to properly lock-out and tag-out the equipment breaker before any intervention on the pump.

Leak detector labels



Located near the main power switch, this label indicates that after disconnecting power supply, the operator should wait 5 minutes before working on the leak detector.



Located near the main power switch, this label indicates that the product has been customized in factory, according to customer order.



Located at the top of the frame, near the exhaust port, this label indicates that the exhaust port should not be blocked.

Safety instructions

DISCONNECT BEFORE MAINTENANCE
DEBRANCHER AVANT ENTRETIEN

Located near the main power switch, this label indicates that the main power cable should be disconnected before maintenance.



Located near the main power switch, this label indicates the part number of the leak detector and its serial number.

ALCATEL
CTI

ATTENTION Pompe primaire sans huile	IMPORTANT Roughing pump without oil
	<p>MISE EN SERVICE</p> <ol style="list-style-type: none"> 1. Mettre de l'huile dans la pompe. 2. Pompe arrêtée, le niveau d'huile doit correspondre au milieu du voyant.
	<p>BEFORE STARTING</p> <ol style="list-style-type: none"> 1. Fill the mechanical pump with oil. 2. Oil level must be on the middle of the sight glass when mechanical pump is not running.

Located on the front cover, this label indicates that the product has been drained before leaving factory. It should be fill with oil before running.

TRANSPORT DE L'APPAREIL EN FONCTIONNEMENT
TRANSPORTATION OF THE LEAK DETECTOR IN OPERATION

PRECAUTIONS !

VOIR MANUEL D'INSTRUCTIONS
SEE INSTRUCTION MANUAL

Located at the upper cover, this label indicates that the leak detector could not be moved in all positions.

Safety instructions

ALCATEL LEAK DETECTION PRODUCTS

WARNING
 THIS INSTRUMENT IS PACKAGED UNDER CONTROLLED ENVIRONMENTAL CONDITIONS. PERMANENT DAMAGE WILL RESULT FROM IMPROPER OPENING.

AVIS
 CET EQUIPEMENT A ETE EMBALLE DANS DES CONDITIONS D'ENVIRONNEMENT CONTROLEES. DES DEGATS IMPORTANTS RESULTERAIENT D'UNE OUVERTURE DE CET EMBALLAGE SANS LES PRECAUTIONS VOULUES.

ACHTUNG
 DER INHALT SYSTEM UNTERSPEZIEN KONTROLLIERTEN UMGERUNGSBEDINGUNGEN VERPACKT. UNSACHGEMAESSES OEFFNEN KANN ZU DAUERNDER BESCHAEDIGUNG FUEHREN.

Located outside the packaging box.



(a)



(b)

Located inside (a) or outside (b) the packaging box, this tilt indicator indicates that the box has been tipped.

Alcatel contact in case of emergency

In case of emergency or equipment failure, please contact your service manager of your local service center (see addresses at the back of the manual).

Unpacking - Storage - Transportation

Unpacking

When the equipment is received, unpack it carefully: do not discard the packaging until you have made sure that the unit has not been damaged during transport. The following are supplied with your unit:

	ASM 182 T	ASM 192 T	ASM 192 T2	ASM 182 TD+	ASM 192 TD+	ASM 192 T2D+
a calibration certificate of the internal calibrated leak	●	●	●	●	●	●
an User's Manual	●	●	●	●	●	●
a RS 232 User's Manual	●	●	●	●	●	●
a maintenance kit	●	●	●	●	●	●
a funnel	●	●	●	●	●	●
an Alcatel 200 oil can	●	(1)	(1)	●	●	●
a RMI socket connector	●	●	●	●	●	●
a connector plug	●	●	●	●	●	●
a connector	●	●	●	●	●	●
2 plastic stoppers	●	●	●	●	●	●
a remote control	●	●	●	●	●	●
a remote control support	●	●	●	●	●	●
a bracket for remote control	●	●	●	●	●	●
a bag with 3 electrical power plugs	●	(2)	(2)	●	(2)	(2)



(1) Qty: 2 oil can for ASM 192 T with roughing option and ASM 192 T2
 (2) Only for equipment in high voltage and US grip

(if one of these parts is missing, contact ALCATEL immediately).

Check the packaging **tilt indicator** of the detector. Before opening, check the **name of the model** and the **serial number**.

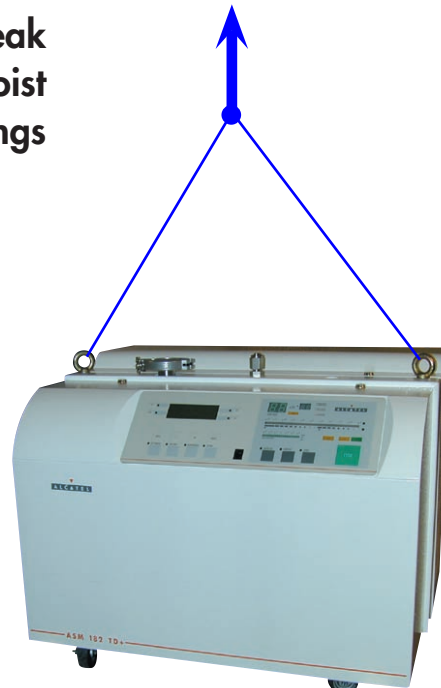
After opening, check the color of the **desiccant bags** packed in the detector casing (red in the event of humidity).

In the event of an anomaly, take the necessary action with the shipper and notify Alcatel if necessary.



Déballage - Stockage - Transport

Handling the leak detector with a hoist and slings

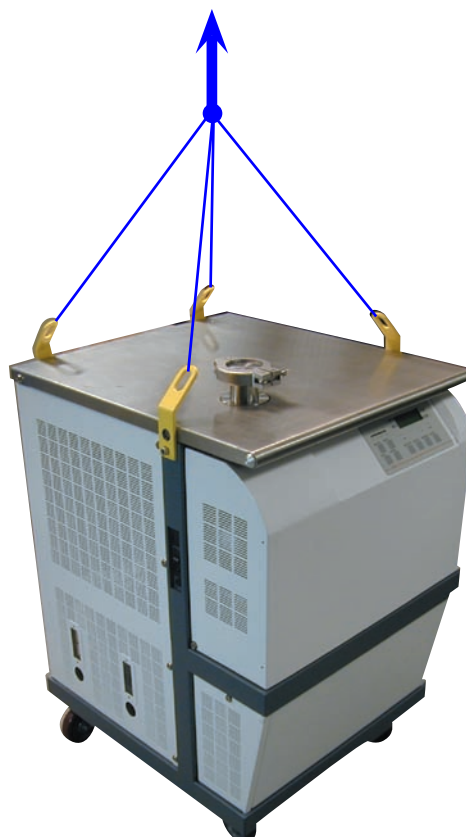


Compact version

Two lifting rings are supplied with the leak detector. Plugs are also supplied to replace the rings during normal use of leak detector.

Note: If the operator doesn't use a hoist, 2 people are necessary to carry the leak detector.


Weight:  A 800



Console version

Four lifting rings are supplied with the leak detector. They will be screw at the back of leak detector after unpacking.

Weight:  A 800 / A 801

 In the event of any damage, contact ALCATEL.

Unpacking - Storage - Transportation

Precautionary measures for the leak detector installation

The leak detector is equipped with 4 pivoting wheels without brake, (2 wheels with brake on the console version). So:

If the detector is placed on a high surface, the operator should take care to lock the wheels of the detector.

It's forbidden to place the leak detector on a sloping surface (> 1 %) without take precautions for its translation stop.

Storage

For prolonged storage, factors such as temperature, humidity, saline atmosphere, etc. may damage the detector elements.

Please call your local representative for further information.

Before starting up after storage for over six months, it is recommended to change all the seals (contact customer service).

The seals kits must be kept away from heat and light (direct sunlight and ultraviolet light) in order to prevent hardening of the elastomers.

Neutral gas purge and inlet vent connection

Products concerned

	Inlet vent	Neutral gas purge
ASM 182 / 192 T ASM 192 T2	✓	
ASM 182 / 192 TD+ ASM 192 T2D+	✓	✓
ASM 142	✓ ⁽¹⁾	
ASM 142 D	✓	✓
ASM 142 S ASM 102 S		
ASM 122 D	✓	✓
ASM 1002	✓	

(1) Requires a special inlet vent kit installation ( **A 700**).

Connection to the leak detector


 **B 210 / B 211**

Neutral gas purge

- If no purge system is connected, the neutral gas purge is connected to the ambient air and maintained an air flow inside the leak detector.

- Even if the leak detector does not use the neutral gas purge, the male quick connector delivered with the leak detector should always be connected to the female free flow quick connector.

Inlet vent

- The inlet vent status (open or closed) depends on the parameters set by the operator ( **C 500**).


- If no inlet vent system is connected, the inlet vent is connected to the ambient air.

Use

Neutral gas purge

- Used to accelerate the cleanup of the helium background noise in the pumps after detecting a significant leak.

- Make high sensitivity testing easier due to the decreasing and stabilization of the helium background noise.

- As a supplement to the neutral gas purge, use the "Depollution" function ( **C 560**).

Inlet vent

- Used to accelerate the cleanup of the helium background noise in the leak detector after detecting a significant leak.

- Make high sensitivity testing easier due to the decreasing and stabilization of the helium background noise.

- Allows to regulate the gas flow inside the leak detector, leak detector in stand-by.

Neutral gas purge and inlet vent connection

Gas characteristics

Type Nitrogen is typically the neutral gas used but you can use any gas on the condition that it is poor in helium (concentration ≤ 1 ppm).
Take care with the ambient air: it should not be polluted with helium.

Quality/purity According to the installation or item to test. The gas should be clean, dry, without dust, no toxic.

Use pressure 0.3 ± 0.1 bar relative (≈ 20 psig).

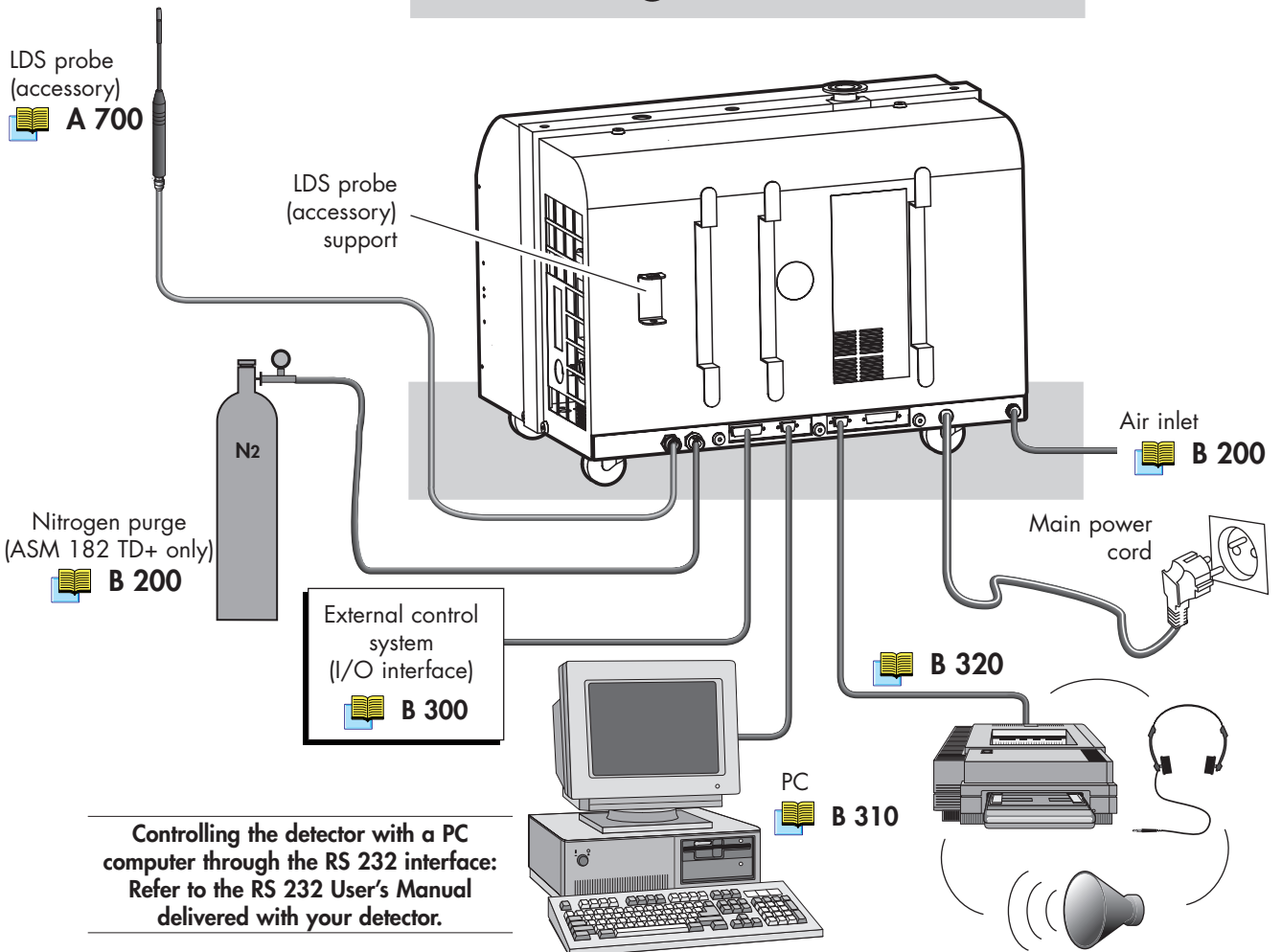
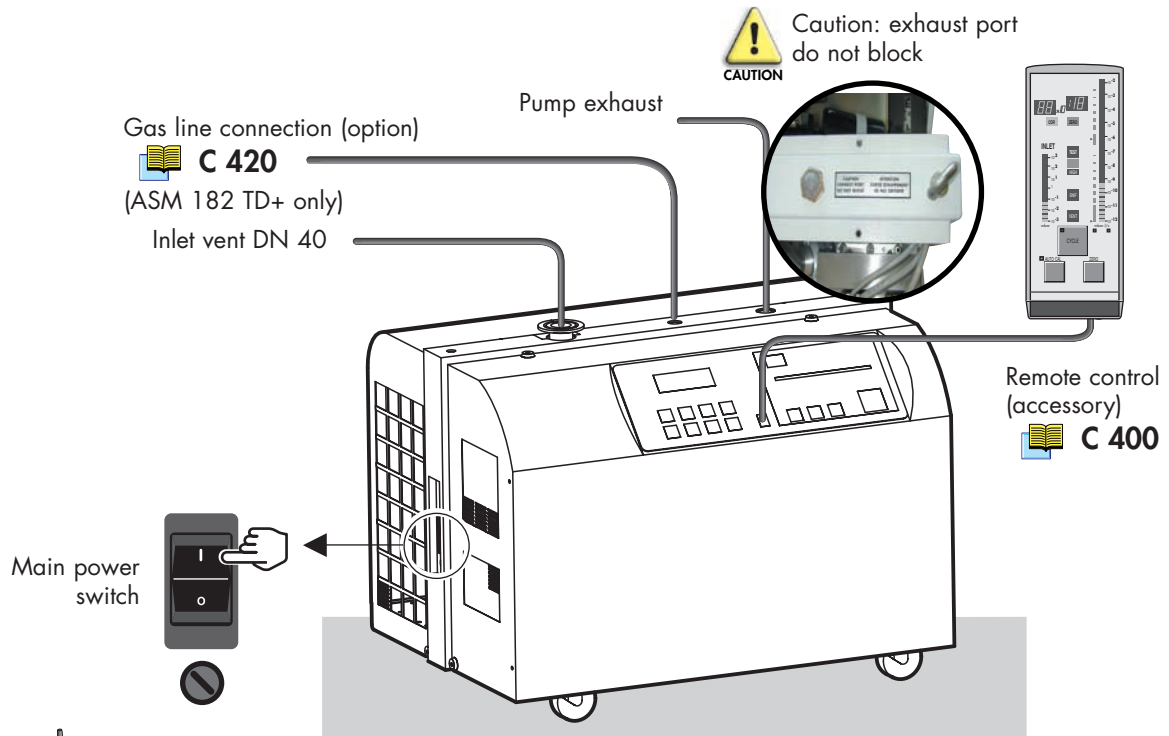


If the inlet vent pressure is too high, the inlet valve will always stay closed.

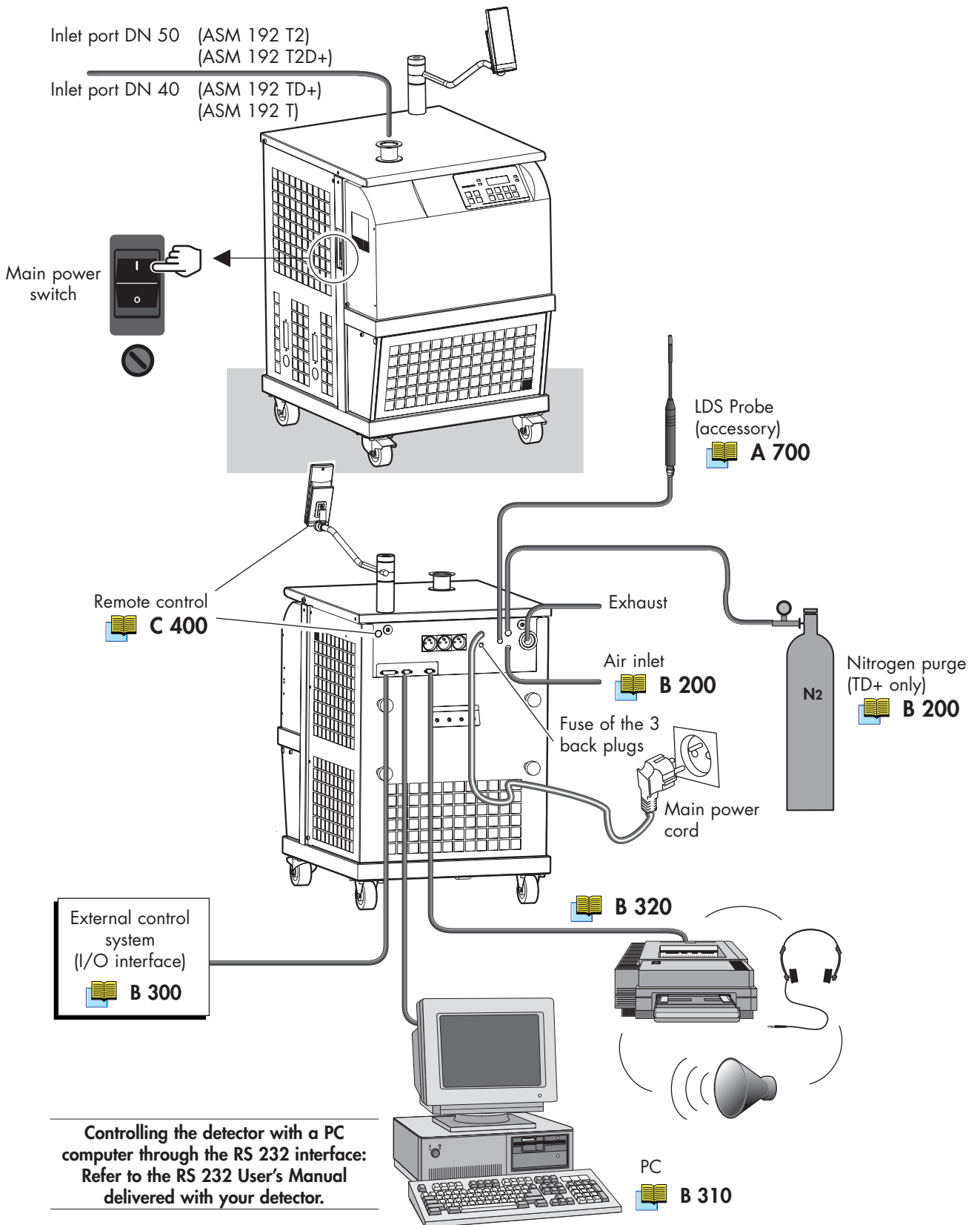
Purge flow

- ASM 122 D - ASM 142 D: ≤ 5 sccm
- ASM 182 TD+: ≤ 50 sccm

ASM 182: connecting the detector to the installation



ASM 192: connecting the detector to the installation



Controlling the detector with a PC computer through the RS 232 interface: Refer to the RS 232 User's Manual delivered with your detector.

Controlling the detector with the I/O interface

Purpose of the I/O interface

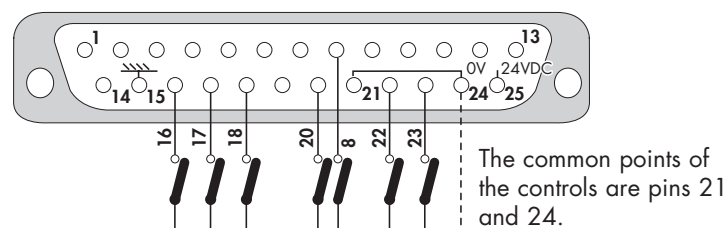
The I/O interface makes it possible to control the leak detector with a PLC or any other external control device.

Location of the I/O interface

The I/O interface is available on a Sub D 25 pin Female connector located on the back of the leak detector.

 **B 210**

Prepare the connector wiring



It is recommended to use a shielded cable which is grounded on the connector cap.

The controls (inputs)

23 Interface	Contact open: the filament command is valid. Contact closed: the filament command is invalid.
22 Calibration	Autocalibration sequence start
8 Cycle	Cycle start
20 Filament	Filament on
18 GL mode	Gross leak mode selection
17 LDS mode	Sniffing mode selection
16 Inlet vent	Vent mode selection

The signals (outputs)

Dry contacts:

Direct current: 60 V - 60 W or 2 A max

Alternative current: 40 V - 125 VA or 2 A max

1 - 2	Sniffer mode (LDS)
3 - 4	Gross leak mode
5 - 6	High sensitivity mode
7 - 9	Test cycle start
10 - 11	Filament on
12 - 13	Helium signal > Reject Set point
19 - 15	Analog output 0 - 10 VDC (inlet pressure)
14 - 15	0 - 8 VDC analog output (Helium signal)

Note:

15 = internal ground

24 = common (external ground)

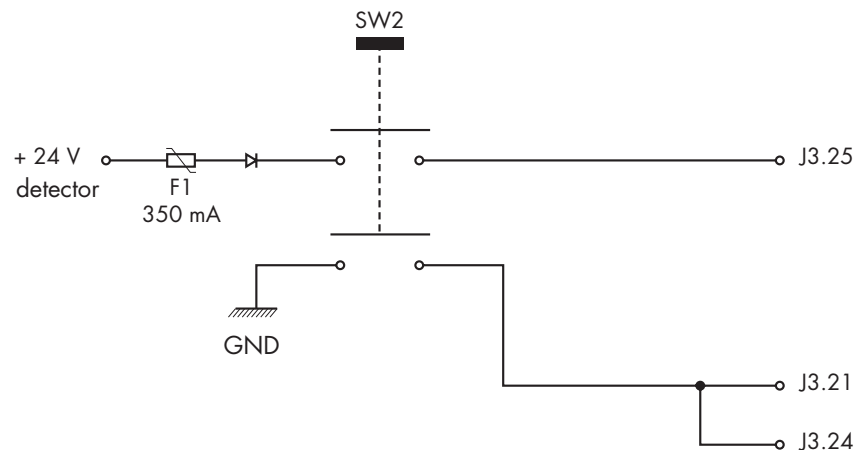
21 = common (external ground)

 **G 300**

Controlling the detector with the I/O interface

24 V DC Power supply

Pin No	24 V DC power supply
25	<p>If SW1 on P0344 interface board is closed (upper position) ⇨ +24V DC (maximum current 350 mA) supplied by leak detector</p> <p>If SW2 is open (lower position) ⇨ (+) point for customer external power supply (24 V)</p>
24, 21	<p>If SW2 on P0344 interface board is closed (upper position) ⇨ External ground</p> <p>If SW2 is open (lower position) ⇨ (-) point for customer external power supply</p>



Controlling the detector with a PC computer through the RS 232 interface

Purpose of the PC computer interface

The RS 232 interface makes it possible to control the leak detector with a PC compatible computer.

Location of the RS 232 interface

It is a Sub D 9 pin Male connector.

Connect the detector to the installation  B 210/211

RS 232 interface instructions

A specific manual describes to the operator all the commands available with the RS 232 Alcatel protocol. It is delivery with your leak detector.

Commands available for your leak detector

Only the commands which correspond to the fonctions of your leak detector are available.

See details in the RS 232 User's manual.



Connecting the detector directly to a printer or another device

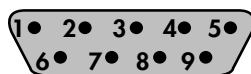
Purpose of the printer interface

The Printer interface makes it possible to connect the leak detector to a printer, an external loudspeaker or a headphone.




Location of the printer interface

It is a Sub D 9 pin Male connector.

 **B 210/211**



Connector description

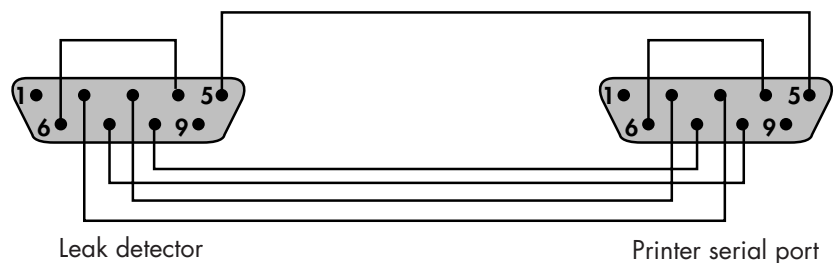
	Pin #	Function	Communication protocol	
	1	External loudspeaker	Mode	Asynchronous
	2	Rx	Bauds	9600
	3	Tx	Bits	8
	4	NA	Parity	None
	5	Ground	Stop bit	1
	6	Headphone	Parity control	None
	7	RTS		
	8	CTS		
	9 	Internal use only. Don't connect it		

Headphone and loudspeaker  **C 410**

Communication mode description






Configuration tickets are sent out.

Connection to the printer



Connecting the detector directly to a printer or another device

Tickets available

Ticket	Example	Print
Configuration	1	Only available for Customer Service
Internal calibration with internal leak	2	Automatic print after an internal calibration with internal/external leak: refer to  C 301
Internal calibration with external leak	3	
Calibration checking with internal leak	5	Automatic print after a calibration checking with internal leak: refer to  C 302
Test	6	Automatic print at the test end: refer to  C 211 / 212  Memo function must be active  C 550

Connecting the detector directly to a printer or another device

Configuration ticket

1

ASM1002 CONFIGURATION TICKET

VERSION: L125v1.0 r00

DATE:Jan/01/2003 TIME:00:00:07

SET-POINTS MENUS

audio level:	3
digital voice level:	3
hard vacuum alarm:	fixed
hard vacuum reject point:	1.0E-07
sniffing alarm:	fixed
sniffing reject point:	1.0E-04
sniffer probe clogged reject:	1.0E-06
bargraph zoom on reject point:	no
depollution function:	off
pollution reject point:	1.0E-05
antipollution GL function:	on
pollution reject point:	3.0E-04
memo. function active:	no
memo. display timer:	no
memo. timer value(min:s):	00:10
cycle end function:	operator
roughing overlap timer:	on
roughing timer value(min:s):	00:10
test timer value(min:s):	00:10
start.timer value(min:s):	00:05
background suppression activation:	operator
trigger:	reject point
GL setpoint (mbar)	1.0E+02
Normal setpoint (mbar)	1.0E-01

SPECTRO MENUS

automatic calibration:	off
calibration check:	operator
every:	0050 cycles
every:	0010 hours

filament in use:	2
electronic zero:	110
acceleration voltage(V):	217
electronic current(mA):	0.0
sensitivity coefficient:	01.00
He calibrated leak location:	internal
value:	1.0E-07
unit:	mbar.l/sec
year:	2003
loss per year(%):	2.00
temperature(C):	20
temp.coefficient(%/C):	3.00

MAINTENANCE MENUS

high vac.mnt.periodicity(hours):	12000
high vac. mnt.due in(hours):	12000
filament#1 running time(hours):	0
filament#2 running time(hours):	0
customed mnt.period.(cycles):	5.0E+05
customed mnt.due in(cycles):	5.0E+05
bicolore remote:	yes
primary pump1 used:	yes
primary pump2 used:	no

OTHER MENUS

test mode selection:	normal
inlet vent mode:	chamber
inlet vent delay(sec):	0
inlet vent open timer us:	no
inlet vent timer value(min/sec):	00:09
hard vacuum correction:	off
hard vacuum cor.coefficient:	1.00E+00
sniffing correction:	off
sniffing cor.coefficient:	1.00E+00
unit:	mbar.l/sec
display language:	english
user interface:	#4
password value:	5555

TYPICAL VACUUM VALUES

Pu_gf:1.00000	Mu_gf :1.0E+06
Pu_n :1.00000	Mu_n :00001.0
	Mu_rld:00015.0

DATE AND TIME VALUES

last stop:	Jan/01/2003 00:00:00
last start:	Jan/01/2003 00:00:02
last calib.ok:	Jan/01/2003 00:00:00

detector counter (h:m:s):	00000:00:50
---------------------------	-------------

Connecting the detector directly to a printer or another device

Calibration ticket with internal calibrated leak

2

```

DATE:Jan/01/2003 TIME:00:03:17
ASM1002 CALIBRATION gas: He
unit: mbar.l/sec

CALIBRATED LEAK PARAMETERS:
location: internal
value: 1.0E-07
unit: mbar.l/sec
calibration year: 2003
loss per year (%): 2.00
calibration temperature (C): 20
temperature coefficient (%/C): 3.00
TARGET PARAMETERS:
current internal temperature (C): 25
target value: 1.2E-07
ELECTRONIC ZERO:
done: yes
PEAK SEARCH :
search: yes
SIGNAL RECORDS (no calibrated):
global: 1.3E-07
background: 7.1E-11
CALIBRATION INFORMATIONS:
total time(sec): 74
result: COMPLETED

CURRENT ASM1002 CALIBRATION:
DATE:Jan/01/2003 TIME:00:03:00
Fil:1 le=0.6 Vacc=232 Coef_sens:00.86
    
```

Calibration ticket with external calibrated leak

3

```

DATE:Jan/01/2003 TIME:00:05:03
ASM1002 CALIBRATION gas: He
Unit : mbar.l/sec

CALIBRATED LEAK PARAMETERS:
location: external
value: 1.0E-05
unit: mbar.l/sec
calibration year: 2003
loss per year (%): 2.00
calibration temperature (C): 20
temperature coefficient (%/C): 3.00
TARGET PARAMETERS:
current external temperature (C): 22
target value: 1.1E-05
ELECTRONIC ZERO:
done: no
PEAK SEARCH :
search: no
SIGNAL RECORDS(no calibrated):
global: 2.0E-05
background: 3.0E-09
CALIBRATION INFORMATIONS:
total time(sec): 64
result: COMPLETED

CURRENT ASM1002 CALIBRATION:
DATE:Jan/01/2003 TIME:00:05:02
Fil:1 le=0.6 Vacc=232 Coef_sens:00.52
    
```


Connecting the detector directly to a printer or another device

Calibration checking ticket with internal leak

5

```

CALIBRATION INFORMATIONS:
DATE|Jan/01/2003 TIME|01:19:23
current internal temperature(C)|          24
current coef.sens|                        00.78
global rate|                             1.10E-07
background rate|                          5.22E-11
calibrated leak-rate|                     1.10E-07
target value|                             1.10E-07
percent allowance (+/-)|                  15
RESULT(%)|                               -0
    
```

Test ticket

6

```

DATE:Jan/01/2003
  HOUR      CASE      PRESSURE      LEAKRATE
00:28:26   start    3.8E+01     3.4E-11
00:28:55    GL      1.2E-02     1.4E-09
00:29:40    NR      6.3E-05     9.1E-06
00:29:45    stop    5.8E-05     1.1E-05
              NR
    
```

Leak value

```

DATE:Jan/01/2003
  HOUR      CASE      PRESSURE      LEAKRATE
01:02:31   start    6.5E+01     4.8E-11
01:02:32    GL      4.6E+01     4.8E-11
01:02:33    NR      5.9E-02     1.8E+00
01:02:36    stop    9.9E-05     1.3E-05
              NR
    
```

Leak value

Test result if Memo function active

Memo function  C 550

Before starting up the leak detector ASM 182 series

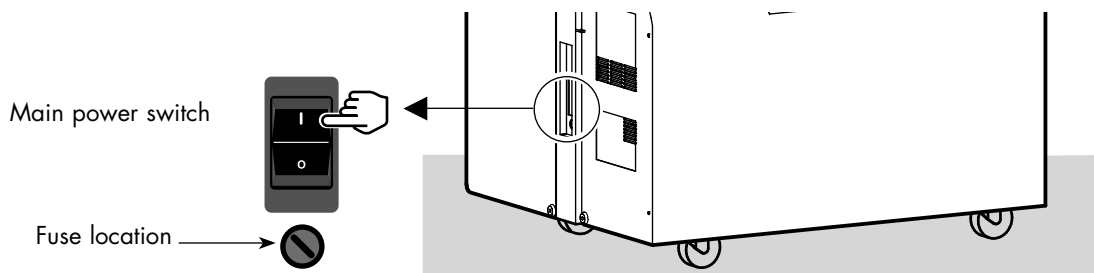
Please acquaint oneself with the safety instructions sheet ( B 100) and the installation sheet ( B 110)

The performance of the detector (pumping speed, accuracy and reliability) depends on:

- the vacuum connections
- the frequency and quality of maintenance
- the helium calibration.

Check power voltage

Check that the power voltage is compatible with the power configuration of the leak detector: check the indications of the label located close to the power switch.



Fuse: 100 - 130 V..... 6.3 A
200 - 240 V..... 3.15 A

Installation

Position the unit so there is no possible risk of it falling or tilting.

The leak detector is equipped with 4 pivoting wheels without brake, (2 wheels with brake on the console version).

So:

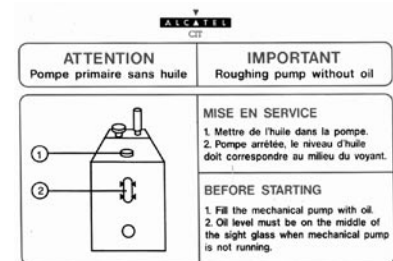
If the detector is placed on a high surface, the operator should take care to lock the wheels of the detector.

It's forbidden to place the leak detector on a sloping surface (> 1 %) without take precautions for its translation stop.

Before starting up the leak detector ASM 182 series

Check the oil level of the roughing pump (ASM 182 T)

The pump has been drained: a label affixed on the cover of the unit indicates this and the filling oil is supplied.



Maintenance of the primary pump  E 750



***The pump will be damaged if it runs without oil.
(> 5 mn).***



***The oil required for the first use is supplied with the detector.
Replacement of oil is the user's responsibility.
The pumps have been tested with ALCATEL 200 oil.
The technical characteristics of the pump are
guaranteed only with the recommended oil.***

Before starting up the leak detector ASM 192 series

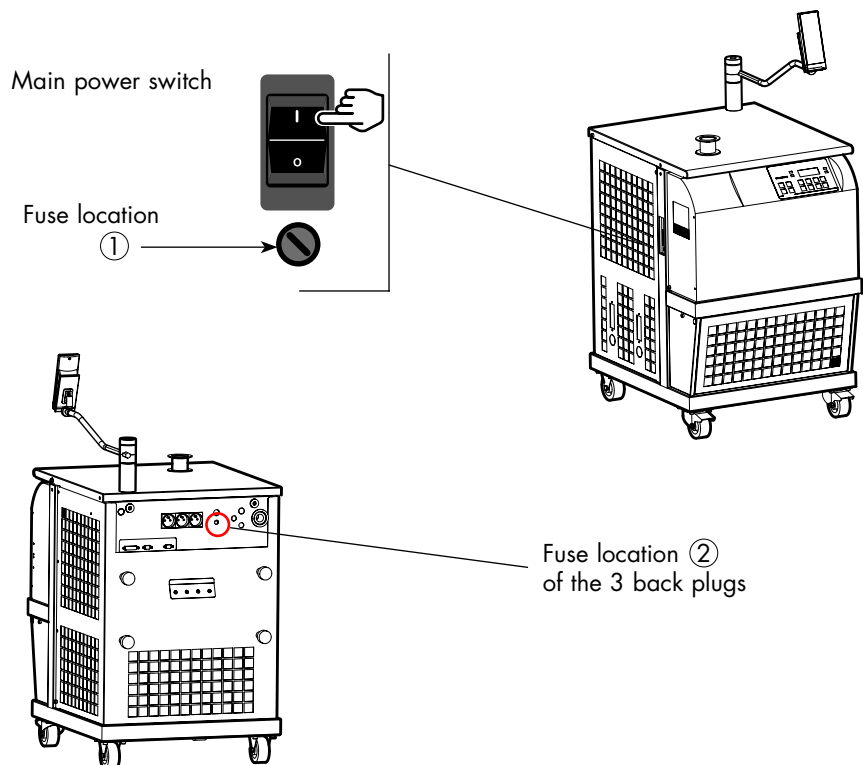
Please acquaint oneself with the safety instructions sheet ( B 100) and the installation sheet ( B 110)

The performance of the detector (pumping speed, accuracy and reliability) depends on:

- the vacuum connections
- the frequency and quality of maintenance
- the helium calibration.

Check power voltage

Check that the power voltage is compatible with the power configuration of the leak detector: check the indications of the label located close to the power switch.



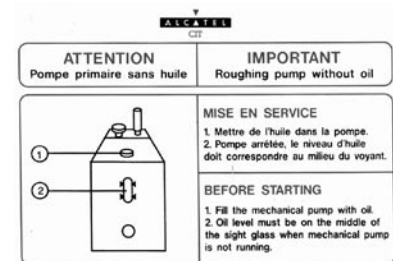
Fuse ①: 100 - 130 V..... 6.3 A
200 - 240 V.....3.15 A

Fuse ②: All voltage : 4 A

Before starting up the leak detector ASM 192 series

Check the oil level of the roughing pump (ASM 192 T / T2)

The pump has been drained: a label affixed on the cover of the unit indicates this and the filling oil is supplied.



Maintenance of the primary pump E 750



***The pump will be damaged if it runs without oil.
(> 5 mn).***



***The oil required for the first use is supplied with the detector.
Replacement of oil is the user's responsibility.
The pumps have been tested with ALCATEL 200 oil.
The technical characteristics of the pump are
guaranteed only with the recommended oil.***

Installation

Position the unit so there is no possible risk of it falling or tilting.

The leak detector is equipped with 4 pivoting wheels without brake, (2 wheels with brake on the console version).

So:

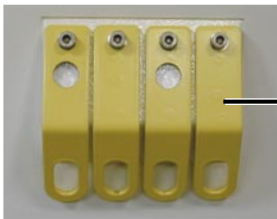
If the detector is placed on a high surface, the operator should take care to lock the wheels of the detector.

It's forbidden to place the leak detector on a sloping surface (> 1 %) without take precautions for its translation stop.

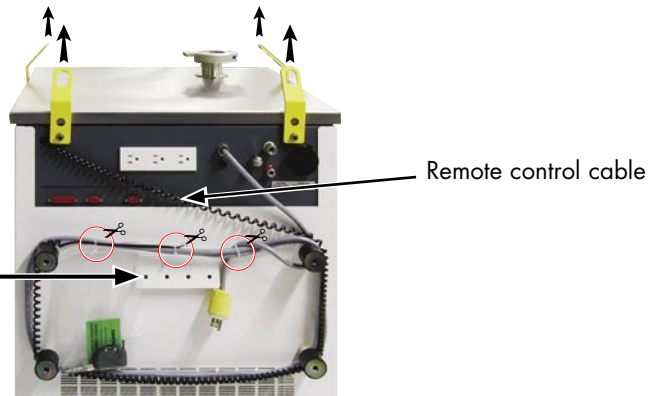
Before starting up the leak detector ASM 192 series

Remote control support installation

5

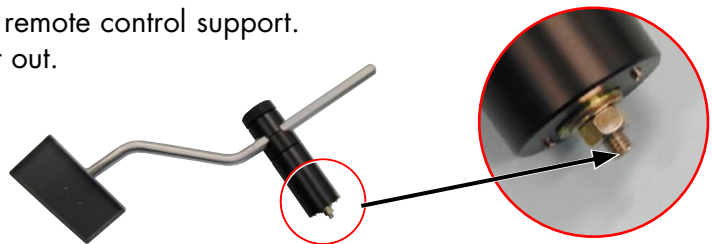


- Remove the 4 liftings rings and screw them to the back of the leak detector. Cut the clamps.



Fix the remote control to its cable.

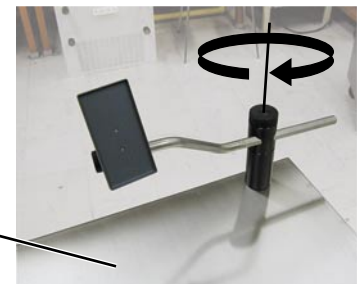
- Unpack the remote control support.
- Take the nut out.



Access to the internal components E 110

- Fix the remote control support on the work table and screw it.

Work table



- Fix the remote control to its cable.

